COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF AGRICULTURE

BULLETIN No. 282

TABULATED ANALYSES OF

Commercial Fertilizers

FROM SAMPLES SELECTED IN ACCORDANCE
WITH ACT OF MAY 1, 1909

BY THE

PENNSYLVANIA DEPARTMENT OF AGRICULTURE

From January 1 to August 1, 1916

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COMMONWEALTH OF PENNSYLVANIA.

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The Act of 1st May 1909, Commonly Referred to as "The New Fertilizer Law" is as Follows:

No. 205.

AN ACT

To regulate the manufacture and sale of commercial fertilizers; prescribing penalties for its violation, and repealing an act, entitled "An act to regulate the manufacture and sale of commercial fertilizers; providing for its enforcement, and prescribing penalties for its violation," approved the twenty-fifth day of March, Anno Domini one thousand nine hundred and one.

Section 1. Be it enacted, &c., That every package of commercial fertilizer sold, offered, or exposed for sale, for manurial purposes within this Commonwealth, except the dung of domestic animals, lime, marl, and wood-ashes, shall have plainly stamped thereon the name and address of the manufacturer or importer and his place of business, the net weight of the contents of the package, the brand or trade-name of the fertilizer the package contains, and an analysis stating the percentage such fertilizer contains of nitrogen in an available form, of potash soluble in water, or soluble and reverted phosphoric acid, and of insoluble phosphoric acid.

Section 2. Every manufacturer or importer of commercial fertilizers, as specified in section one of this act, shall, on or before the first day of January of each year, or before offering them for sale in this Commonwealth, file annually with the Secretary of Agriculture a statement of the names and number of brands of such commercial fertilizers, having distinct trade-names, that he shall offer for sale during the next ensuing year, and a copy of the analysis of each one of such brands of commercial fertilizers, as required by section one of this act.

Section 3. In addition to the statement required by section two of this act, every manufacturer or importer of commercial fertilizers shall, on or before the first day of January of each year, or before offering them for sale in this Commonwealth, file annually with the Secretary of Agriculture an affidavit showing the amount of each brand of fertilizer, having a distinct trade-name, sold within the Commonwealth during the last preceding year; and if the said amount shall be one hundred tons or less, he or they shall pay or

cause to be paid to the Secretary of Agriculture the sum of fifteen dollars for each and every brand of such commercial fertilizer, having a distinct trade-name sold within the State during the last preceding year; and if the said amount shall exceed one hundred tons, and be less than five hundred tons, he or they shall pay the sum of twenty dollars, as aforesaid; and if the said amount shall be five hundred tons or more, he or they shall pay the sum of thirty dollars, as aforesaid. If such manufacturer or manufacturers, importer or importers, shall not have made any sales within the Commonwealth during the preceding year, he or they shall pay the sum of fifteen dollars upon each such brand, as aforesaid: Provided, That all monies so received shall be immediately paid by the Secretary of Agriculture into the State Treasury, for the use of the Commonwealth.

Section 4. No person shall sell, offer, or expose for sale, in this State, any pulverized leather, hair, ground hoofs, horns, or wool waste, raw, steamed, roasted, or in any form, as a fertilizer, or as an ingredient of a fertilizer or manure, without an explicit statement of the fact; said statement to be conspicuously affixed to every package of such fertilizer or manure, and to accompany and go with every lot, parcel, or package of the same.

Section 5. Any person or persons selling, offering, or exposing for sale, any commercial fertilizer or any brand of the same, having a distinct trade-name, without the analysis required by section one of this act, or with an analysis stating that it contains a larger percentage of any one or more of the above-named constituents than is contained therein, or for the sale of which all the provisions of sections two and three have not been complied with, or any person violating any of the provisions of section four of this act, shall be guilty of a misdemeanor, and, on conviction, shall be sentenced to pay a fine of not less than twenty-five nor more than one hundred dollars for the first offense, and not less than two hundred dollars for each subsequent offense. It shall be the duty of the Secretary of Agriculture to enforce the provisions of this act, and all penalties, costs, and fines recovered shall be paid to him or his duly authorized agent, and by him shall be immediately paid into the State Treasury, for the use of the Commonwealth.

Section 6. The Secretary of Agriculture is hereby empowered to collect samples of commercial fertilizers, either in person or by his duly qualified agent or representative, and to have them analyzed, and to publish the results for the information of the public; and for this purpose the said Secretary of Agriculture, such assistants, agents, experts, chemists, detectives,

and counsel as he shall duly authorize, shall have full access, ingress, and egress to and from all places of business, factories, barns, buildings, carriages, cars, and vessels, used in the manufacture and transportation, or sale, of any commercial fertilizer. They shall also have power to open any package or vessel containing or supposed to contain any commercial fertilizer, and take therefrom samples for analysis, upon tendering the value of said samples.

Section 7. The term "commercial fertilizers," as used in this act, shall be construed to mean any and every substance imported, manufactured, prepared, or sold for fertilizing or manuring purposes, except the dung of domestic animals, marl, lime, and wood-ashes, and not exempt by the provisions of section one of this act.

Section 8. This act shall go into effect on and after the thirty-first day of July, one thousand nine hundred and nine; and the act entitled "An act to regulate the manufacture and sale of commercial fertilizers; providing for its enforcement, and prescribing penalties for its violation," approved the twenty-fifth day of March, Anno Domini one thousand nine hundred and one, is hereby repealed.

Approved—The 1st day of May, A. D. 1909.

EDWIN S. STUART.

No. 95.

AN ACT

Making it unlawful for any person, firm, or corporation, engaged in the manufacture or sale of commercial fertilizers, to use the word "bone" in connection with, or as part of the name of, any fertilizer, or any brand of the same, unless the phosphoric acid contained in such fertilizer shall be the product of pure animal bone; and providing a penalty for violation of the same.

Section 1. Be it enacted, &c., That it shall be unlawful for any person, firm, or corporation, engaged in the manufacture or sale of commercial fertilizers, to use the word "bone" in connection with, or as part of the name of, any fertilizer, or any brand of the same, unless the phosphoric acid contained in such fertilizer shall be the product of pure animal bone.

Section 2. Any person or persons violating the provisions of this act shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall pay a fine of fifty dollars for the first offense, and a fine of not less than one hundred dollars, nor more than two hundred dollars, for every subsequent offense; such fine or fines to be paid into the State Treasury, for the use of the Commonwealth. The Secretary of Agriculture shall, together with his deputies, agents, and assistants, be charged with the enforcement of this act.

Section 3. All magistrates, aldermen, and justices of the peace throughout this Commonwealth shall have jurisdiction to hear and determine actions arising from violations of the provisions of ths act, and shall have authorty to hold for court, or to impose the penalty hereby prescribed, subject to appeal, as the law shall direct.

Section 4. This act shall go into effect on the first day of January, Anno Domini nineteen hundred and ten.

Approved—The 23d day of April, A. D. 1909.

EDWIN S. STUART.

LETTER OF TRANSMITTAL.

State College, Pa., July 18, 1916.

Hon. Chas. E. Patton, *Secretary of Agriculture, Harrisburg, Pa.:*

Dear Sir: I have the honor to transmit herewith my report upon the analyses of the samples of commercial fertilizers received from official sampling agents during the spring season of 1916.

Very respectfully,

WM. FREAR.

FERTILIZER ANALYSES JANUARY 1 TO AUGUST 1, 1916.

Since January 1, 1915, there have been received from authorized sampling agents one thousand five hundred seventy-two fertilizer samples, of which five hundred and six were subjected to analysis. Preference was given to those which have not been recently analyzed. In cases where two or more samples representing the same brand were received, equal portions from several samples were united, and the composite sample was subjected to analysis.

The samples analyzed group themselves as follows: 217 complete fertilizers, furnishing phosphoric acid, potash and nitrogen; 185 dissolved bones and other additional fertilizers furnishing phosphoric acid and nitrogen; 1 rock-and-potash fertilizer, furnishing phosphoric acid and potash; 66 acidulated rock phosphates, furnishing phosphoric acid only; 26 ground bones, furnishing phosphoric acid and nitrogen, and 10 miscellaneous samples, which group includes substances not properly classified under the foregoing heads.

The determinations to which a complete fertilizer is subjected are as follows: (1) Moisture, useful for the comparison of analyses, for indication of dry condition and fitness for drilling, and also of the conditions under which the fertilizer was kept in the warehouse. (2) Phosphoric acid—total and insoluble; the latter is, that portion not soluble in water nor in warm ammonium citrate solution (a solution supposed to represent the action of plant roots upon the fertilizer), which is assumed to have little immediate food value. By difference, it is easy to compute the so-called "available" phosphoric acid. (3) Potash soluble in water—Most of that present in green sand marl and crushed minerals, and even some of that present in vegetable materials such as cotton-seed meal, not being included because insoluble in water even after long boiling. (4) Nitrogen—This element is determined in such manner as to ascertain its *total* quantity and also, the quality of the organic nitrogenous material present in the finished fertilizer. The fertilizer is washed thoroughly with water, which removes the nitrates, ammonium salts and almost all of the cyanamid nitrogen, and the soluble organic nitrogenous materials. These are not separately determined but are grouped under the name "*water-soluble nitrogen.*" The quantity of *water-insoluble nitrogen* is directly determined, and by difference between its amount and the total nitrogen, the water-soluble nitrogen is calculated. Another

portion of water-insoluble material* is treated with alkaline potassium permanganate, which attacks the nitrogenous organic substances present, and converts the more active portion into ammonia, which is distilled off, determined, and its nitrogen calculated as *"active insoluble nitrogen."* The *"inactive insoluble nitrogen"* is then computed by subtracting the active insoluble from the total insoluble nitrogen. The term "available nitrogen" as used in this report, is the sum of the water-soluble and the active insoluble nitrogen. It is equivalent to the total nitrogen less the inactive insoluble nitrogen. In high grade organic nitrogenous materials, among which, from its behavior with this treatment, must be included horn meal, the percentage of inactive nitrogen in the insoluble nitrogen is usually under 40 per cent.; and the ratio of inactive to active insoluble nitrogen in such materials is usually less than 60:100. On the other hand, in the case of low-grade nitrogenous materials, the proportions of inactive nitrogen are much higher. The separations effected by these methods are therefore of great value in distinguishing whether the insoluble nitrogen is derived from high grade materials, or from low grade substances such as garbage tankage, peat, mora meal, unacidulated hair, leather, etc. There is, however, one fertilizer ingredient rapidly coming into use, whose presence may lead to erroneous conclusion, if judgment is based solely upon the facts ascertained by the foregoing method, namely, cyanamid. This substance contains from 13 to 16.5 per cent. of nitrogen, of which 12 to 14.7 per cent. is soluble in water, by the mode of treatment used in the alkaline permanganate method; and, of the 1.0 to 1.7 per cent. of water-insoluble nitrogen, less than one-fifth is active; so that the ratio of inactive to insoluble nitrogen is about 80:100. Owing to its tendency to reduce the availability of the phosphoric acid in acid phosphate mixtures, limited quantities only of this ingredient can be used advantageously in mixed fertilizers. Nevertheless, in cases where low grade sources of nitrogen are indicated by the foregoing method, it would be needful to determine, by supplementary tests, whether or not cyanamid may be present to account for an undue proportion of inactive, insoluble nitrogen, before concluding that such excess of inactive nitrogenous material is attributable to low-grade nitrogenous constituents. It is desirable to keep in mind at this point the fact also that certain widely used low-grade nitrogenous substances, such as garbage tankage, peat and mora meal, are not included in the list of substances whose presence requires specific declaration under Section 4 of the Fertilizer act. (5) Chlorin—This determination is made to afford a basis for estimating the proportion of the potash that is present as chlorid

*This determination has been omitted in all cases where the insoluble nitrogen is only .2 per cent. or less.

or muriate, the cheaper source. The computation is made on the assumption that the chlorin present, unless in excess, has been introduced in the form of muriate of potash; but doubtless there are occasional exceptions to this rule. One part of chlorin combines with 1.326 parts of potash to form the pure muriate; knowing the chlorin, it is, therefore, easy to compute the potash equivalent thereto. (7) In the case of ground bone, the state of sub-division is determined by sifting through accurately made sieves; the cost of preparation and especially the promptness of action of bone in the soil depend very largely on the fineness of its particles, the finer being much more quickly useful to the plant.

The analytical details for incomplete fertilizers are similar to the foregoing, except as one or another constituent is absent, and diminishes the scope of examination required.

The legislation of 1909 has made needful some additional tests. Section 4, of the Act of May 1, 1909, prohibits the sale of "pulverized leather, hair, ground hoof, horns, or wool waste, raw, steamed, roasted, or in any form, as a fertilizer, or as an ingredient of a fertilizer or manure, without an explicit statement of the fact." All nitrogenous fertilizers have, therefore, been submitted to a careful microscopic examination, at the time of preparing the sample for analysis, to detect the presence of the tissues characteristic of the several materials above named.

The act of April 23, 1909, makes it unlawful to use the word "bone" in connection with, or as part of the name of any fertilizer, or any brand of the same, unless the phosphoric acid contained in such fertilizer shall be the product of pure animal bone. All fertilizers in whose name the word "bone" appears, were therefore examined by microscopic and chemical methods to determine, so far as possible with present knowledge, the nature of the ingredient or ingredients supplying the phosphoric acid. It is a fact, however, well known to fertilizer manufacturers and which should be equally understood by the consumer, that it is, in certain cases, practically impossible to determine the source of the phosphoric acid by an examination of the finished fertilizer. The microscope shows clearly the structure of raw bone, but does not make it possible to discriminate between thoroughly acidulated bone and acidulated rock. The ratio of nitrogen to phosphoric acid in a raw bone—and only such bone as has not been deprived of any considerable proportion of its nitrogenous material by some manufacturing process can properly be called "pure animal bone"—is about 1:8. In cases where the ratio of phosphoric acid to nitrogen exceeds 8, it is clear that part, at least, of the phosphoric acid has been supplied by something else than pure animal bone; but, inasmuch as nitrogen may have been introduced in some

material other than bone and no longer detectible by the microscope, the presence of nitrogen and phosphoric acid in the proportions corresponding to those of bone is not proof positive that they have been supplied by bone. Finally, the differences in the iron and silica content of bone and rock respectively, afford means of distinction useful in some cases; the usefulness of this distinction is limited, however, by the facts tnat kitchen bone frequently contains earthy impurities rich in iron and silica, and that earthy fillers can legally be used in fertilizers and are in fact considerably used therein both as "make-weights" and as "conditioners," or materials introduced to improve the drilling qualities of the goods. The fact that the phosphoric acid in bone and rock is identical in character is probably so well known as to require no detailed consideration in this connection.

The law having required the manufacturer to guarantee the amount of certain valuable ingredients present in any brand he may put upon the market, chemical analysis is employed to verify the guaranties stamped upon the fertilizer sacks. It has, therefore, been deemed desirable in this report to enter the guaranty filed by the manufacturer in the office of the Secretary of Agriculture, in such connection with the analytical results that the two may be compared. An unforunate practice has grown up among manufacturers of so wording the guaranty that it seems to declare the presence in the goods of an amount of valuable constituent ranging from a certain minimum to a much higher maximum; thus, "Potash, 2 to 4 per cent." is a guaranty not infrequently given. In reality, the sole guaranty is for 2 per cent. The guaranteed amounts given for each brand in the following tables, are copied from the guaranties filed by the maker of the goods with the Secretary of Agriculture, the lowest figure given for any constituent being considered to be the amount guaranteed. For compactness and because no essentially important fact is suppressed thereby, the guaranties for soluble and reverted phosphoric acid have not been given separately, but are combined into a single guaranty for available phosphoric acid; in cases where the maker's guaranty does not specifically mention available phosphoric acid, the sum of the lowest figures given by him for soluble and reverted phosphoric acid is used. The law of 1879 allowed the maker to express his guaranty for nitrogen either in terms of that element or in terms of the ammonia equivalent thereto; since ammonia is composed of three parts of hydrogen and fourteen parts of nitrogen, it is a very simple matter to calculate the amount of one, when the amount of the other is given; the amount of nitrogen multiplied by 1.214 will give the corresponding amount of ammonia, and the amount of ammonia multiplied by 0.824 will give the corresponding amount of nitrogen. In these tables, the expression is in terms of nitrogen.

The laws of 1901 and 1909 abolished the alternative and required that the quantity shall be given in terms of nitrogen.

Many manufacturers, after complying with the terms of the law, insert additional items in their guaranties, often with the result of misleading or confusing the buyer; the latter will do well to give heed to those items only that are given as the law requires and that are presented in these tables:

Summary of Analyses Made This Season (Spring, 1916).

	Complete fertilizers.	Rock and potash.	Acidulated fertilizers supplying phosphoric acid and nitrogen.	Dissolved rock.	Ground bone.
Number of analyses,	217	1	185	66	216
Moisture, per cent.,	7.52	4.28	6.90	8.41	5.87
Phosphoric acid:					
Total, per cent.,	10.53	5.33	11.97	16.19	22.16
Available, per cent.,	9.32	4.82	10.61	15.46	.....
Insoluble, per cent.,	1.21	.51	1.36	.73	.....
Potash, per cent.,	1.17	.62	.....	.....	.....
Nitrogen, per cent.,	1.85	.....	1.86	.....	3.03
Mechanical analysis of bone:					
Fine (per cent.),	.....	.....	.....	.....	47
Coarse (per cent.),	.....	.....	.....	.....	53
Average selling price,	$28.24	$16.30	$23.61	$18.27	$36.30

The unusual conditions of raw materials supply, due to the disturbances of the European war, have very greatly modified the average character of the fertilizers sold in Pennsylvania, both with respect to the distribution of the market brands among the several classes of fertilizers, and also to the average composition of certain classes. The percentage proportions of the several classes of fertilizers analyzed in Pennsylvania during the past five seasons was:

	Complete.	Rock and potash.	Dissolved bone.	Dissolved rock.	Ground bone.	Miscellaneous.
1914, Spring,	67.3	17.4	.5	4.0	3.1	7.7
Fall,	62.5	22.0	.4	8.4	5.1	1.6
1915, Spring,	69.2	14.1	1.5	7.9	3.9	3.4
Fall,	61.7	12.4	8.7	10.3	5.0	1.9
1916, Spring,	42.9	.2	36.6	13.0	5.1	2.0

The changes here shown are caused, almost entirely, by the potash scarcity due to the cutting off of the German potash salt imports, but are due in part also to the larger raw materials requirements of the munitions makers of this country. Fertilizer manufacturers have tried to eke out their supplies of potash salts, first, by diminishing the number of brands in which potash was offered; second, as the succeeding table shows, by reducing the percentage of potash in those brands for which it has been retained; and, third, by dropping almost entirely the supplying of potash salts to home-mixers. The present season shows the most extensive readjustment due to this cause; in fact, it shows the absence from the market of the class known as "rock-and-potash"; a one-third reduction of the completes, and a greatly increased number of brands offering only available phosphoric acid and nitrogen.

Composition, 1914-1916.

	Phosphoric acid. Total.	Potash.	Nitrogen.
	%	%	%
Complete fertilizers:			
1914, Spring,	9.31	5.67	1.81
Fall,	9.84	3.42	1.29
1915, Spring,	10.56	3.05	1.95
Fall,	10.41	1.94	1.28
1916, Spring,	10.53	1.17	1.85
Rock-and-potash:			
1914, Spring,	10.63	4.77	.....
Fall,	11.18	3.50	.....
1915, Spring,	12.35	2.16	.....
Fall,	12.07	1.87	.....
1916, Spring,	5.33	.62	.....

The rock-and-potash figure for the present season represents only one brand, and that of unusual composition throughout. Out of 215 brands of fertilizers for which potash was guaranteed, only 12 guarties were for 2 per cent. or over; 182 for 1 to 1.5 per cent., usually the former; while in 16 cases only 0.5 per cent. was guaranteed, and in 5 cases 0.25 per cent.

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A farmer applying 300 pounds of the brands last mentioned, would add *less than one pound* of potash to an acre of land. This is an excellent time for the observant crop grower to form a judgment concerning the agricultural value of the potash he has heretofore been buying for application to his grain, grass and even his potato lands. The potash-rich special brands for vegetables, fruit and to-

bacco have utterly disappeared, not merely as the result of the potash shortage, but also because of the possibility of making them was sacrificed for the purpose of retaining a large number of general purpose brands for each of which a little potash could be guaranteed.

Departures from Guaranty.

For the purpose of indicating more specifically to the eye, cases deficient from guaranty, an asterisk has been affixed in the analytical tables where the ingredient has been found less in quantity than the manufacturer guaranteed. Too great emphasis should not be placed upon very slight deficiencies, because very slight imperfections in mixing and slight variation in analysis are practically unavoidable. The asterisk has been used, therefore, only in cases where the deficiencies amount to 0.2 per cent. or more, except where nitrogen has been guaranted in amounts no higher than 1.0 per cent., in which case an asterisk has been affixed where the deficiency amounts to 0.1 per cent. or more.

The cases of departure of goods from their guaranteed composition observed this season, including only those cases in which it amounted to 2-10 per cent. or more were as follows:

Summary of Instances of Deficiency from Guaranty.

	Complete fertilizers.	Rock and potash.	Dissolved bone, etc.	Dissolved rock.	Ground bone.
Deficient in four constituents,	0	0	0	0	0
Deficient in three constituents,	1	0	0	0	0
Deficient in two constituents,	4	0	3	2	1
Deficient in one constituent,	27	0	32	5	7
Total number of samples in which deficiencies occur,	32	0	25	7	8

The cases of deficiency noted during the past nine seasons in the composition of goods as compared with their guaranties, expressed in percentage of the total number of goods of each class analyzed, are as follows:

Percentage of Deficiency, 1911-1915.

	Fall, 1911.	Spring, 1912.	Spring, 1913.	Fall, 1913.	Spring, 1914.	Fall, 1914.	Spring, 1915.	Fall, 1915.	Spring, 1916.
Complete fertilizers,	46.9	39.0	32.3	36.0	23.1	27.1	21.3	29.1	14.7
Dissolved bone, etc.,	100.00	50.0	50.0	66.7	50.0	0.0	14.0	31.9	18.9
Rock and potash,	43.4	33.6	26.4	46.0	26.7	35.8	14.0	31.9	0.0
Dissolved rock,	11.9	12.5	20.9	22.5	33.3	18.9	14.7	10.3	10.6
Ground bone,	20.0	29.2	25.0	22.2	47.8	31.8	12.5	36.3	30.9
All classes except miscellaneous,	46.0	36.0	30.4	35.0	32.0	28.0	19.6	29.0	16.5

A comparison of the average composition of all samples of complete fertilizers for which guaranties are recorded with the average of the corresponding guaranties, for several seasons past, including those of this season, follows:

Average Composition and Guaranty Compared.

	Average composition. Per cent.	Average guaranty. Per cent.
Spring, 1912.		
Phosphoric acid:		
Total,	9.51	8.82
Available,	8.09	7.78
Potash,	5.34	5.05
Nitrogen,	1.56	1.58
Fall, 1912.		
Phosphoric acid:		
Total,	9.90	9.07
Available,	8.28	7.83
Potash,	4.06	3.57
Nitrogen,	1.28	1.30
Spring, 1913.		
Phosphoric acid:		
Total,	9.71	8.92
Available,	8.11	7.37
Potash,	5.41	5.17
Nitrogen,	1.61	1.62
Fall, 1913.		
Phosphoric acid:		
Total,	9.86	9.09
Available,	8.06	7.83
Potash,	4.28	4.27
Nitrogen,	1.47	1.35
Spring, 1914.		
Phosphoric acid:		
Total,	9.31	8.71
Available,	8.06	7.65
Potash,	5.67	5.52
Nitrogen,	1.81	1.69
Fall, 1914.		
Phosphoric acid:		
Total,	9.84	9.25
Available,	8.41	8.00
Potash,	3.42	2.99
Nitrogen,	1.29	1.27

Average Composition and Guaranty Compared—Continued.

	Average composition. Per cent.	Average guaranty. Per cent.
Spring, 1915.		
Phosphoric acid:		
Total,	10.56	9.34
Available,	9.05	8.00
Potash,	5.05	3.12
Nitrogen,	1.95	1.82
Fall, 1915.		
Phosphoric acid:		
Total,	10.41	9.21
Available,	9.11	7.89
Potash,	4.94	1.88
Nitrogen,	1.28	1.15
Spring, 1916.		
Phosphoric acid:		
Total,	10.53	9.40
Available,	9.32	8.40
Potash,	1.17	1.05
Nitrogen,	1.85	1.67

MATERIALS USED IN FERTILIZERS.

The sampling agents report no case of declaration under the requirements of Section 4 of the fertilizer law, nor has microscopic examination shown any decisive evidence of the presence in any fertilizer of more than accidental traces of any of the substances specified in that section.

On the other hand, the results of the examination of the condition of the nitrogen in the complete fertilizers by the alkaline permanganate method affords much that is suggestive.

To keep the tables down to convenient size, the percentages of active insoluble nitrogen found have been omitted. They can be computed, however, from the figures given, by deducting from the total nitrogen the sum of the soluble and the inactive insoluble nitrogen. The ratio which the active insoluble bears to the inactive insoluble nitrogen being the principal indication the method as here used gives respecting the character of the organic nitrogenous ingredients of the fertilizer, the index letters, 'a,' 'b,' and 'c' (or equivalent characters) have been affixed to the percentages of inactive insoluble nitrogen, to indicate the ratios between the active and inactive insoluble in the several samples. Cases in which the active constitutes

three-fifths or more of the insoluble are marked 'a'; two-fifths to three-fifths, 'b,' and less than two-fifths, 'c.' The New England Stations use the terms 'good,' 'doubtful' and 'poor' for these respective classes of cases.

Of the 386 samples examined this season, 182 belong to class 'a,' 172 to 'b,' and 32 to 'c.'

It is needful to keep clearly in mind the meaning of the index 'c' as thus applied. Its presence does not suffice to indicate that the fertilizer contains no readily available nitrogen, but merely that part or all of the insoluble nitrogen is derived from low-grade sources, barring cases in which cyanamid is one of the fertilizer ingredients. These low-grade materials may be such as are listed in Section 4 of the law, or others in common use, such as garbage tankage, peat or mora meal; and they may, if of animal origin, have had their nitrogenous materials changed almost entirely to an available condition by 'wet mixing,' which has, however, little improving effect upon the nitrogenous constituents of garbage tankage and mora meal, and little more upon those of peat.

The use of such low-grade materials is either to make the fertilizer less likely to become sticky or lumpy, or to supply nitrogen from materials that would otherwise be wholly thrown to waste. The use of 'conditioners' for the former purpose is, in itself, desirable rather than objectionable; but becomes obnoxious and unjust when the nitrogen they contain in unavailable form is made the basis of a charge at high rates to the buyer. The use also of low-grade and therefore cheap nitrogen supplies whose nitrogen has, by chemical treatment, been made useful for plant-food, is laudable provided the materials are sold for what they are.

In cases where the inactive insoluble nitrogen forms a large fraction of the total nitrogen, is marked by the index 'c,' the guaranty does not exceed the available nitrogen by an amount equal to most of the 'inactive,' and the selling price, corrected for freight difference, is not considerably less than that asked for fertilizers of like general composition but supplying nitrogen derived from high-grade goods such as bear the index 'a' or even 'b,' there is reason to believe that the buyer is being subjected to unfair treatment.

Section 1 of the Fertilizer Law of 1909 requires that the guaranty for a fertilizer shall state 'the percentage such fertilizer contains of nitrogen in an available form.' It is, however, by no means clear that the term 'available,' as used in the law, means precisely the same thing that is meant by that term when used to designate the sum of the water-soluble and active insoluble nitrogen, as determined by the present method. For some nitrogenous fertilizer ingredients always regarded as of high grade, such as dried blood, meat tankage,

and cottonseed meal, contain considerable fractions of inactive insoluble nitrogen when examined by this method. Until further notice, therefore, the law will not be construed to require that the amount of nitrogen guaranteed shall not exceed that present in a form that will appear as 'available' by the alkaline permanganate method now in use.

In many of this season's samples, however, the quantity of nitrogen thus available is found equal to the percentage guaranteed. On the average, the 'available' nitrogen found was 1.54 per cent., the total 1.85, the guaranteed, 1.67 per cent.

FERTILIZER RAW MATERIALS.

The market prices for the contract season, September 1, 1915, to March 1, 1916, have been exceptionally difficult to ascertain. A rough approximation is obtained from the files of the *Oil, Paint and Drug Reporter,* of New York City.

Average Wholesale Prices, September 1 to March 1.

Substance.	Amount Priced.	Average price Sept. 1, 1914, to March 1, 1915.	Average price Sept. 1, 1915, to March 1, 1916.	Prices, Sept.-March, 1915-16, in per cent. of prices of 1914-15.
Sulphate of Ammonia,	Cwt.,	$2.748	$3.689	134.6%
Nitrate of Soda,	Cwt.,	1.937	3.069	157.9%
Dried Blood, H. G.,	Unit* (20 lbs.),	3.089	3.293	106.6%
Concentrated Tankage,	Unit* (20 lbs.),	2.943	2.775	94.3%
Rough Bone,	Ton,	23.25	23.25	100.0%
Bone Meal,	Ton,	29.25	29.25	100.0%
Fish Ground (Dry),	Unit* (20 lbs.),	3.28	3.439	104.8%
Phosphate Rock, Tenn.,	Ton,	5.25	5.25	100.0%
Acid Phosphate,	Unit (20 lbs.),	.475	.724	152.4%
Double Manure Salt,	Ton,	Not quoted	105.00	.....
Sulphate of Potash,	Ton,	Not quoted	323.80	.....
Kainit,	Ton,	Not quoted	45.00	.....
Muriate of Potash,	Ton,	Not quoted	389.40	.....
Sulphuric Acid, 66° B.,	Cwt.,	1.05	2.342	223.0%

*The unit here is 20 lbs. of ammonia, equivalent to 16.5 pounds of nitrogen.

According to these quotations, the ammoniates and phosphate rock produced in this country showed little price change; but sulphate of ammonia, nitrate of soda and potash salts, the last two all

imported, and the first partly so, showed large, and in the case of the potash salts, enormous increases. Sulphuric acid, though itself made in America, jumped to a high price level; and, as a result, added 50 per cent. to the price of acid phosphate. Concentrated tankage was the only raw material for which a lower price was quoted during the last contract season, and the reduction in that case was but slight.

Within the contract season, according to this source of information, ammonium sulphate began to advance in November, and the monthly price average thereafter showed a continuous increase. Nitrate of soda began its advance in February, 1915, gained slowly but fairly steadily until September, and then advanced rapidly through the season. Sulphuric acid, 66° Baume, which had for some years been quoted without change at $1.05 a hundredweight, jumped to $1.625 in January, 1915, to $2.125 in September last, and reached $2.75 early in January of this year. Muriate of potash was quoted at $39.07 when the European war began, and then, of course, began to rise, to $39.57 about the middle of August, 1914, where it held until January, 1915, after which the change was so rapid that quotatons were, for a time, omitted. In March, 1915, it reappeared at $118.50; July 1st, at $240.00; November 8th, at $400.00; December 13th, $577.50; and, thereafter, declined to $455.00, the last of February. Sulphate of potash, which, under normal conditions, is always more expensive than the muriate, suffered a relative depreciation because of the munition advantages of the muriate. The sulphate was quoted at $47.57 in July, 1914; at $125.00 in March, 1915, and reached $440 by the first of December last, from which high point it receded to $337.50 by the last of February, 1916. It is clear from these quotations, that the quoted price for muriate in December last was about fifteen times the price quoted at the beginning of the war; that for the sulphate, betwee nine and ten times as great. The price changes for kainit, while great, have been much less than those for the purer salts. Quoted at $8.36 in July, 1914, it arose to $8.56 by August 17th, and there held until January, 1915, when quotations ceased until last August, when they reappeared at $45.00. The price history of double manure salt was much like that of kainit, namely, July, 1914, $25.04; January, 1915, $25.54; March, $55.00; July 26, $105.00, the quotation now standing.

All these later quotations are special sale quotations. The amounts changing hands are not great, and the prices quoted probably do not represent the true sale price averages, under the extremely unusual conditions. When there are few lots of a commodity changing hands, price quotations are of relatively small value.

The fact that our commercial potash supply has, for years, been almost exclusively obtained from Germany; that she, early in the

war, placed an embargo upon potash shipments; that heavy munitions contracts placed with American manufacturers created a large and unusual demand upon the potash stocks here accumulated; and that no American potash sources existed capable of quick utilization, are enough to account for the potash supply situation.

With respect to our ammonium sulphate, nitrate of soda and sulphuric acid, another fact chiefly determined price changes. While we manufacture a good deal of ammonium sulphate and throw away in our furnace and coke oven furnace a vast amount, a large fraction of that heretofore used in our manufactures has been imported from England, and, after a time, she placed an embargo on these shipments to save the product for her own use. Our nitrate of soda comes exclusively from Chili and Peru; for we have in the States no supply that can be utilized by present methods in competition with the usual South American prices, and none at all that can be made quickly available by a simple manufacturing plant. The sulphur for our sulphuric acid was once chiefly obtained from the volcanic deposits of Sicily, but the sulphur burners in our factories were later almost entirely replaced by pyrites furnaces; the pyrites, iron sulphide, were in some measure obtained from Virginia, more largely from Nova Scotia; but chiefly from the rich deposits of Huelva, Spain. It is true that in the sulphur beds a thousand feet below the surface of the island of Calcasieu, Louisiana, which the engineering genius of Fraasch has made available, America has what is potentially the sulphur pre-eminence of the world; but this is simply a future possibility, with the requirements of much time and a large, fixed capital investment—neither of which requirements can be met when we are in a hurry to provide for a temporary condition. We waste more sulphur than ammonia in furnace and coke oven fumes. To protect our forests and fields from destruction, smelters have been required to purify their gaseous products. The result of this recent requirement is that about one-fifth of our total sulphuric acid output comes from a few smelters. Here, too, however, time and fixed capital investment are involved in plant enlargement, and fail us under such conditions as now exist. In the second place, the acid demand of the munition makers has been enormous; and while our acid output has greatly increased to meet this enlarged demand, the difficulty of securing Huelva pyrites in sufficient amount limited the output and largely dominated the price situation.

Various conditions at the source to some extent, of course, affected the prices of these imported commodities; but the great price addition to the importer was due to the altered conditions of ocean transportation. According to a recent study of these conditions the war has resulted in the diversion from mercantile use of 15 million out

of the world's total of 40 million tons of ocean freight bearing capacity; in the creation of an unprecedented export from this and other neutral countries to certain European open ports, and in greatly increased marine insurance rates. All of these influences have tremendously raised ocean transportation costs. Still another factor has added to the freight cost of nitrate of soda, namely, the closure by slides in the Culebra cut of the Panama Canal, as the result of which vessels laden with this product have carried their loads to our eastern coast by the way of Cape Horn, with a large additional charge for the extra cost of this longer journey.

It is difficult, in the few sentences that may here be given to the subject, to picture the changes in American industry due to these conditions, as these changes affect the fertilizer trade. Despite raw materials difficulties, every abandoned sulphuric acid plant that could be put into operation was set to work and immense new plants have been built. In 1915, according to the report of the U. S. Geological Survey, we made 4 million tons of sulphuric acid, as compared with about 1.5 million in 1909. The higher prices stimulated our ammonium sulphate manufacture, so that, though the English embargo is now modified, we are taking little of England's product. In April, 1916, we imported twice as much nitrate of soda as in the same month of 1915, despite the higher prices. There has been much endeavor, with but slight success, to find and develop our most available potash resources. Meanwhile, our brokers have scoured the world for re-sale stocks with which to supply our potash needs. Our export grades of rock phosphate have lost, for the present, much of their foreign market. Owing to the potash shortage, the changes in brand composition, and the higher prices, fertilizer sales have fallen off.

Finally, another very important fact must be mentioned that is of vast possible influence upon our manufactures. The European countries, which in a sudden time of need turned to us for an unusual volume of certain commodities, began earnestly to develop their own production, and have so far succeeded that they are now placing relatively few new orders with us, or buying only at lower prices. Already, the heavy demands of the late months of 1915, have fallen off, and prices are seeking lower levels. Muriate of potash, which then brought $475 to $500 a ton is now being offered by some brokers in small resale lots as low as $3.75 a unit. Sulphuric acid prices are becoming easier, after the tremendous jumps they took from October to February last, and some plants have already shut down.

FERTILIZER VALUATIONS.

Those charged with the responsibility of making official valuations for commercial fertilizers have hitherto established price schedules for fertilizer constituents for use during the entire year of their publication. These schedules have been based upon the wholesale prices ruling during the preceding contract season and also upon such trustworthy semi-retail quotations as were available. The officers of the Experiment Stations of New England, New Jersey and New York fixed the schedule for their own states at an annual conference. At the meeting of March, 1916, these officrs, after considering the lack of thoroughly representative data for raw materials costs during the past contract season, and also the existence of conditions which would probably lead to unsettled prices during the latter part of this calendar year, formally adopted a resolution declaring the impracticability of fixing a schedule of valuations for the present year.

Pennsylvania has, so far as her somewhat different system of valuation and her different market conditions would permit, used the New England schedule as a valuation basis. After conference between the Secretary of Agriculture and the writer, it has been deemed wise to abandon attempts at detailed valuation of Pennsylvania samples for the current year; for under existing conditions, any figure that might be used was likely to be either misleading or unjust to the retail buyer, or unfair to the seller.

Nevertheless, it is desired that the users of fertilizers shall have the best view we can give, of retail price conditions. If we assume, for the purpose of approximation, that in all goods but the ground bone and miscellaneous materials, the available phosphoric acid was supplied exclusively in acidulated phosphate, potash in muriate of potash, and nitrogen from a single source, the averages for composition and for selling price afford us the basis for computing the actual selling price of each of the three constituents. If we deduct from the final retail prices, the allowances for freight, local agents' commissions, mixing and bagging, the approximation will be to jobbers' prices.

Thus the average acidulated phosphate analyzed this season contained 15.46 per cent. of available phosphoric acid and cost $18.27 a ton. The retail price is equivalent to $1.17 a unit (20 pounds or one per cent. of a ton) or 5.9 cents a pound for available phosphoric

acid. The jobbers' price, that is, the retail price less allowances for freight, commission and bagging, as usually figured would be $10.22 a ton, 66.1 cents a unit, or 3.3 cents a pound.

The average acidulated fertilizer supplying phosphoric acid and nitrogen contained 10.61 per cent. of available phosphoric acid and 1.86 per cent. of nitrogen and cost $23.61 a ton at retail. At $1.17 a unit, the 10.61 per cent. or units of available phosphoric acid would take up $12.41 of the retail cost, leaving $11.20 cents to pay for the nitrogen. At 1.86 per cent., this means $6.02 a unit, or 30 cents a pound retail for this constituent. Taking off retailing allowances, the computed jobbers' price is $16.01 a ton; 10.61 units of available phosphoric acid on a jobbers' basis of 66.1 cents, equals $7.01 for this constituent, which leaves $9.00 to pay for the nitrogen (1.86%); and the corresponding jobber's value for the nitrogen is $4.84 a unit, or 24 cents a pound.

The average complete fertilizer contained 9.32 per cent. of available phosphoric acid, 1.85 per cent. of nitrogen, and 1.17 per cent. of potash, and cost at retail $28.24. Using the retail prices as above calculated, of $1.17 a unit for phosphoric acid and $6.02 a unit for nitrogen, the amounts of these constituents found in the average complete fertilizer would cost $10.90 and $11.04, respectively, or together $22.04. This leaves $6.20 to pay for the potash (1.17 per cent.) and is equivalent to $5.15 a unit or 26 cents a pound. The jobber's price basis ($19.87 a ton) computed as in the foregoing cases, would yield $4.74 for the potash, or $4.05 a unit or 20 cents a pound.

The foregoing method of calculation ignores the customary distinction between the prices of phosphoric acid in acidulated rock and in complete fertilizers that derive most of their phosphoric acid from bone. For years, owing to the differences in market values of these two phosphoric acid supplies, the available phosphoric acid from bone has been assigned a valuation about one-fifth higher than that from rock. If we figure the prices of ingredients in complete and in available phosphoric acid and nitrogen fertilizers on the basis of 7 cents a pound for available phosphoric acid, we get for the nitrogen and potash, the following retail prices: Nitrogen, 23.5 cents; potash, 27.7 cents. The nitrogen price thus obtained is more nearly in accordance with the New York wholesale quotations, than is that obtained by the mode of calculation first applied.

Accepting the results of the first described method for acid phosphate, and the modified method for the other two classes of goods,

we have the following retail prices applicable to cases where the freight for car load lots is $2.00 a ton:

	Unit.	Pound. Cents.
Available phosphoric acid:		
In rock goods,	$1.17	5.9
In bone goods,	1.40	7 0
Potash,	5.44	27.7
Nitrogen,	4.71	23.5

Early in the season it was rumored that prices to the retailer might run about $1.00 a unit for available phosphoric acid in goods containing 16 per cent. or more of available, with a deduction of 50 cents a unit for every per cent. shortage in this constituent; $5.00 a unit for potash and $4.00 a unit for nitrogen. This would mean a minimum pound price of 5 cents for available phosphoric acid and fixed prices of 25 and 20 cents a pound, respectively, for potash and nitrogen. These rates applied to the average percentage obtained this season, would yield $19.23 for complete fertilizers, vs. $19.87 as above calculated; for other fertilizers containing available phosphoric acid and nitrogen, $15.35 vs. $16.01; and for dissolved rock phosphate, $15.19 vs. $10.22. It is evident that prices for complete fertilizers and those supplying available phosphoric acid and nitrogen ran very close to those indicated in the first sentence of this paragraph, but that acid phosphate itself was sold at a relatively much lower figure by the retailer. The actual jobber's price for acid phosphate undoubtedly averaged more than $10.22, so far as we can judge from quotations known to us.

In general, the retail buyer can form a fair judgment of the nearness to average cost of the price he paid for his fertilizers of any of the preceding classes if he will multiply the guaranty figures on the fertilizer sacks by their respective prices given in the second paragraph preceding, $1.17 for available phosphoric acid, by $6.02 for nitrogen, and by $7.17 for potash, taking the sum of the products as representative for a locality where freights from the factory cost $2.00 a ton by the carload lots, and increasing or diminishing the sum by the excess or deficiency from this freight allowance of his local freight rate on the carload basis from Baltimore or Philadelphia.

Bone values have considerably increased, this year. The following comparison of composition, fineness and cost for the past five seasons will make clear present prices relative to those of recent years:

	Composition.		Fineness.		Retail Price.
	Phosphoric acid.	Nitrogen.	Fine.	Coarse.	Ton.
	%	%			
1914, Spring,	21.34	3.08	49.0	51.0	$31.43
Fall,	23.37	3.40	55.0	45.0	32.20
1915, Spring,	21.46	2.96	53.0	47.0	33.44
Fall,	23.03	3.13	52.0	48.0	32.79
1916, Spring,	22.16	3.03	47.0	53.0	36.30

In a general way, jobbing prices of 20 and 18 cents a pound for nitrogen in fine and coarse bone, respectively, and 4 and 3 cents a pound for the phosphoric acid in these fractions according to fineness, would correspond to this season's jobbing prices for ground bone; the corresponding retail figures, when freight is $2.00, would be, for nitrogen, 26½ and 24 cents, and for phosphoric acid, 5¼ and 4 cents.

ORGANIZATION OF THE WORK.

The work of the season has been performed under my direction as follows:

The nitrogen determinations, total, by G. C. Given, Ph.D.; available, by A. B. Long, B. S.; the total phosphoric acid and moisture, by G. J. Kuhlman, B. S.; the insoluble phosphoric acid, by F. J. Holben, B. S.; and C. A. Kern; the potash and chlorin, by E. S. Erb, M. S.; the computations by M. Verna Bryce and others. Dr. G. C. Given had charge of the reception and preparation of samples, and immediate supervision of analytical work. To all these assistants the writer is indebted for loyal aid.

COMPLETE

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	ALPHANO HUMUS CO., NEW YORK CITY.		
1161	Prepared Alphano Humus, ...	L. A. Wheeler, Derry, ...	21.87
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK CITY.		
1104	Complete Manure for Top Dressing, 1916,..	John B. Buckman, Newtown, ...	7.87
326	Eagle Phosphate, ...	R. W. Daub, Muir, ...	8.76
882	Odorless Grass and Lawn Top Dressing,..	Weeks Hardware Co., Scranton, ...	8.47
1447	Wheat, Corn and Grass Fertilizer, ...	John W. Buckman, ...	.31
114	Allen's Popular Phosphate, 1916, ...	H. W. Burg, Hellam, ...	9.57
74	Bradley's Complete Manure for Potatoes and Vegetables, 1916.	Shultz & Pardoe, Franklin, ...	5.03
769	Bradley's Eclipse Phosphate, 1916, ...	Skelton & Baker, Edinboro, ...	6.59
499	Bradley's Golden Eagle, 1916, ...	Edwin L. Myers, Gardenville, ...	7.89
500	Bradley's Half Century Fertilizer, 1916,...	Edwin L. Myers, Gardenville, ...	9.34
609	†Bradley's New Method Fertilizer, 1916,..	E. M. Putman, Columbus, ...	5.86
381		R. S. Hardie, Mehoopany, ...	
742		S. J. Saint, Sharpsburg, ...	
916	†Canton Chemical Baker's Special Wheat Corn and Grass Mixture, 1916.	M. L. Stultz & Son, Hollidaysburg,	8.58
1287		B. S. Noll, Middletown, R. No. 1,..	
1051	Canton Chemical Eagle Phosphate, ...	W. B. Winey, Middleburg, ...	7.36
1516	Canton Chemical Potato and Truck Manure.	Irwin Mengle, Barnesville, ...	9.19
744	Canton Chemical Potato and Vegetable Manure, 1916.	G. F. Mack, New Florence, R. No. 2,	6.38
614	†Crocker's Complete Manure, 1916, ...	J. M. Abbott, Sugargrove, ...	8.96
1168		I. W. Gibson, Indiana, ...	
36	†Crocker's General Crop Fertilizer, ...	John Greenleaf, Quarryville, ...	5.87
1167		I. W. Gibson, Indiana, ...	
1201	Crocker's Harvest Jewel Fertilizer, 1916,..	E. D. Everts, Warren, ...	7.31
613	Crocker's Potato, Hop and Tobacco Fertilizer, 1916.	Engstrom & Peterson, Chandler Valley.	6.92
612	†Crocker's Universal Grain Grower, 1916,	Engstrom & Peterson, Chandler Valley.	5.61
1207		C. H. Smith & Co., Sheffield, ...	
718	†Detriek's Corn and Oats Fertilizer, ...	Enos Barkey, Evans City, ...	6.45
1358		A. M. Austin, Glen Rock, R. No. 3,	
719	Detrick's Kangaroo Komplete Kompound, 1916.	Enos Barkey, Evans City, ...	8.75
799	Detrick's Special Ammoniated Compound,..	Somerset Milling Co., Somerset, ...	8.43
973	East India Corn King, ...	Theodore Gerhart, Gilberts, ...	7.44
1099	Great Eastern General, 1916, ...	Julius Long, Danboro, ...	7.68
1101	Great Eastern High Grade Potato Fertilizer, 1916.	Julius Long, Danboro, ...	8.60
1100	Great Eastern Northern Corn Special, 1916,	Julius Long, Danboro, ...	9.15
998	Lazaretto A. A. Crop Grower, ...	Geo. Ufflemau, Parke, ...	9.05
241	Michigan Carbon Works Red Line Complete Manure.	Davis & Hyde, Spartansburg, ...	8.69
258	Milsom's Potato and Cabbage Manure, 1916,	Lake Shore Fruit Co., North East,	9.40
620	†Milsom's Wheat, Oats and Barley, 1916,	Will Russell, Lottsville, ...	6.02
727		A. O. McKissick, Euclid, ...	
1117	Moro Phillips Farmers' Potato Mixture, 1916.	Isaac J. Tustin, Phoenixville, ...	6.58
760	Moro Phillips Special Fertilizer, 1916, ...	Nathan Huntzicker, New Ringgold,..	9.51
1266	Moro Phillips Standard Guano, 1916, ...	J. I. Goss, Painterville, ...	10.62
1	North Western Complete Compound, 1916,..	A. E. Baker, Ernigsville, ...	8.63
318	†Packer's Union Universal Fertilizer, 1916,	Monroe Savidge, Hegins, R. D., ..	6.88
892		S. Peck & Son, Nittany, ...	
198	†Sharpless & Carpenter Fish Guano, 1916,	Hilles & Taggart, Norristown, ...	7.51
764		J. Kunkle & Son, Orwigsburg, ...	
200	Sharpless & Carpenter No. 1 Brand Phosphate, 1916.	Hilles & Taggart, Norristown, ...	8.82
557	†Sharpless & Carpenter No. 2 for Grass and Grain.	Paxton Flour & Feed Co., Bowmansdale.	7.52
679		W. J. Leister, Cocolamus, ...	

†Composite sample.

FERTILIZERS.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
Available.			Total.				Total.					Total.		
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Water soluble.	Available.	Inactive insoluble.	Found.	Guaranteed.	
83	.50	1.11	1.94	.....	.84	.....	.84	.50	.40	1.05	c1.07	2.12	1.25	20.00
9.19	8.00	.83	10.02	9.00	1.46	.....	1.46	1.00	2.47	3.42	a.42	*3.84	4.11	45.00
8.62	7.00	1.28	9.90	8.00	.98	.....	.98	1.00	.79	1.00	a.12	1.12	.82	30.00
8.71	8.00	.55	9.26	9.00	1.18	.....	1.18	1.00	2.94	3.60	a.34	3.94	3.70	42.00
10.04	9.00	1.34	11.38	10.00	1.38	.....	1.38	1.00	.72	1.01	a.17	1.18	.82	30.00
8.86	8.00	1.00	9.86	9.00	1.10	.....	1.10	1.00	.53	.73	b.17	.90	.82	23.00
10.17	9.00	.93	11.10	10.00	1.18	.....	1.18	1.00	2.74	3.17	a.15	3.32	3.29	42.00
11.36	10.00	1.22	12.58	11.00	1.16	.....	1.16	1.00	1.07	1.42	a.12	1.54	1.23	29.00
8.27	8.00	.82	9.09	9.00	1.38	.....	1.38	1.00	2.78	3.81	a.56	4.37	4.11	37.00
10.42	10.00	.89	11.31	11.00	1.08	.....	1.08	1.00	1.33	1.76	a.24	2.00	2.06	29.00
9.97	8.00	1.22	11.19	9.00	.78	.....	*.78	1.00	.57	.93	a.15	1.08	.82	{27.00 / 24.00 / 30.00
10.84	9.00	1.39	11.23	10.00	.98	.....	.98	1.00	.74	.89	a.09	.98	.82	{25.00 / 24.00
7.30	7.00	1.49	8.79	8.00	1.26	.....	1.26	1.00	.55	.71	b.15	.86	.82	24.00
9.65	9.00	.85	10.50	10.00	1.04	.....	1.04	1.00	2.10	2.97	a.27	3.24	3.29	35.00
10.73	10.00	1.39	12.12	11.00	.90	.....	.90	1.00	.94	1.22	a.12	1.34	1.23	26.00
11.78	10.00	1.25	13.03	11.00	.53	.35	.88	1.90	.58	.76	a.11	.87	.82	{28.00 / 26.50
8.07	7.00	1.11	9.18	8.00	1.06	.....	1.06	1.00	.59	.83	a.12	.95	.82	{21.00 / 26.00
10.75	9.00	.51	11.26	10.00	.93	.....	.93	1.00	1.39	1.77	a.11	1.88	1.65	34.00
11.60	10.00	.00	12.20	11.00	.86	.....	.86	1.00	1.49	1.88	a.10	1.98	2.06	34.00
9.88	8.00	1.60	11.48	9.00	.77	.....	*.77	1.00	.54	.88	a.12	1.00	.82	{28.00 / 33.00
10.13	9.00	1.24	11.37	10.00	.86	.....	.86	1.00	.60	.81	a.09	.90	.82	{26.00 / 23.00
12.34	10.00	.65	12.99	11.00	.61	.....	*.61	1.00	1.39	1.68	a.10	1.78	1.65	28.00
9.08	8.00	1.32	10.40	9.00	1.28	.....	1.28	1.00	.70	.84	b.11	.95	.82	24.00
11.01	9.00	.20	11.21	10.00	1.08	.....	1.08	1.00	1.35	2.05	a.35	2.40	2.47	30.00
8.08	8.00	.87	8.95	9.00	1.04	...	1.04	1.00	.75	.97	a.12	1.09	.82	22.00
11.19	10.00	.88	12.07	11.00	.84	.	.84	1.00	1.26	1.74	a.16	1.90	1.65	25.50
9.70	8.00	.89	10.59	9.00	.89	.....	.89	1.00	1.19	1.80	a.26	2.06	2.06	26.50
9.68	8.00	1.56	11.24	9.00	1.06	.....	1.06	1.00	1.24	1.58	a.18	1.76	1.65	25.50
9.43	8.00	2.09	11.52	9.00	1.12	.....	1.12	1.00	.48	.66	b.16	.82	.82	25.50
11.89	10.00	.80	12.69	11.00	.85	.....	.85	1.00	.54	.78	b.17	.95	.82	25.25
9.07	8.00	1.50	10.57	9.00	.68	.....	*.68	1.00	.46	.69	a.14	.83	.82	{24.50 / 26.00
11.50	10.00	.93	12.43	11.00	1.12	.....	1.12	1.00	.78	1.18	a.18	1.36	1.23	32.00
10.06	8.00	.92	10.98	9.00	.96	.....	.96	1.00	1.20	1.69	a.28	1.97	2.06	28.00
11.61	10.00	1.10	12.71	11.00	1.32	.....	1.32	1.00	1.04	1.31	a.09	1.40	1.23	25.00
8.46	8.00	1.42	9.88	9.00	1.20	.....	1.20	1.00	.51	.69	b.22	.91	.82	20.82
8.93	8.00	1.60	9.93	9.00	1.04	.....	1.04	1.00	.69	.88	a.09	.97	.82	{23.50 / .....
9.28	8.00	.80	10.08	9.00	.92	.....	.92	1.00	1.38	1.97	a.21	2.18	2.06	{30.00 / .....
10.79	9.00	1.13	11.92	10.00	1.18	.....	1.18	1.00	1.16	1.74	a.25	1.99	1.65	29.00
8.70	7.00	1.47	10.17	8.00	1.38	.....	1.38	1.00	.68	.85	b.14	.99	.82	{23.50 / 22.00

a, b, c. Characters indicating the proportion of insoluble nitrogen that is inactive: a=2/5 or less; b=2/5 to 3/5; c=3/5 or more.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK CITY—Continued.		
1166	Sharpless & Carpenter, Potato, Corn and Truck Guano, 1916.	I. W. Gibson, Indiana,	8.71
199	†Sharpless & Carpenter Soluble Tampico	Hilles & Taggart, Norristown,	8.29
763	Guano, 1916.	J. Kunkle & Son, Orwigsburg,	
982	Susquehanna Ammoniated Phosphate, 1916,	Wm. Weaver, Freemandsburg,	7.45
1458	Susquehanna Potato Phosphate, 1916,	H. P. Passmore & Bro., Oxford,	6.94
983	Susquehanna Special Potato and Tobacco Manure, 1916.	Wm. Weaver, Freemansburg,	9.10
116	Tygert Allen's Star Brand Phosphate, 1916.	H. W. Burg, Hallam,	9.19
115	†Tygert Allen's Star Potato Grower, 1916,	H. W. Burg, Hellam,	9.22
275		Miller & Bushong, Rohrerstown,	
657	Tygert Allen's Standard Brand Phosphate, 1916.	Greenwald & Benograft, New Tripoli,	8.96
380	Williams & Clark's Americus Potato Manure, 1916.	J. V. Taylor & Sons, Wyalusing,	2.13
955	Williams & Clark's Elk Brand, 1916,	F. H. Houseknecht, Seybertsville,	7.43
496	Williams & Clark's Matchless Fertilizer, 1916.	Jacob Rush, Plumsteadville,	7.07
956	Williams & Clark's Special Prolific Crop Producer.	F. H. Houseknecht, Seybertsville,	7.83
1067	Zell's Special Compound for Potatoes and Vegetables, 1916.	N. R. Snyder, Elizabethville,	7.37
	AMERICAN FERTILIZER CO., BALTIMORE, MD.		
70	Bob White Emergency Compound, Revised.	Mr. Carnagy, Vintage,	8.89
448	†American Fish and Bone Compound, Revised.	Mussleman Bros., New Holland,	8.32
850		R. B. Hyson, Bridgeton,	
573		N. R. Yost, Myerstown,	
27	†American Reliable Guano,	J. M. Peifer, Quarryville, R. No. 1,	7.79
955		Burt Hoff, Spring Grove,	
	ARMOUR FERTILIZER WORKS, BALTIMORE, MD.		
281	†Grain Grower,	H. S. Newcomer, Mt. Joy,	6.33
606		R. J. Helenbrook, Custer City,	
204	†Armours 4-8-2,	C. E. Price, Huntingdon Valley,	6.38
278		H. S. Newcomer, Mt. Joy,	
205		C. E. Price, Huntingdon Valley,	
95	†Armour's 3-8-1,	United Hdw. & Supply Co., Titusville.	4.96
355		D. G. Stufft, Stoyestown,	
444		S. H. Snavely, Manheim,	
211	†Armour's 2-8-1,	W. S. Buckman, Hatboro,	6.38
598		M. L. Bachman, Lebanon,	
206		C. E. Price, Huntingdon Valley,	
94	†Wheat, Corn and Oats Special, 1-7-1,	United Hdw. & Supply Co., Titusville.	4.71
303		A. P. Lippey, Littlestown,	
	R. S. AUCKER, SHAMOKIN, PA.		
1043	Economy Phosphate,	Chas. S. Hendricks, Selinsgrove,	8.44
1041	Grade B. Bone and Slaughter House Phosphate.	Chas. S. Hendricks, Selinsgrove,	7.65
1042	Grade D. Phosphate,	Chas. S. Hendricks, Selinsgrove,	4.43
	BAUGH & SONS CO., PHILADELPHIA, PA.		
522	†Baugh's Animal Base and Potash Compound for all crops.	J. C. Emery & Co., Nottingham,	7.79
1347		J. A. Umble & Bro., Bird-in-Hand,	
525		E. H. Keen & Co., Parkesburg,	
108	†Baugh's Ammoniated Soluble Alkaline,	Milton Weimon, Dover,	5.83
726		O. W. Luck, Zelienople,	

†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
Available.			Total.				Total.					Total.		
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Water soluble.	Available.	Inactive insoluble.	Found.	Guaranteed.	
11.72	10.00	.89	12.61	11.00	.93	.....	.93	1.00	.90	1.28	a.11	1.39	1.23	28.80
10.13	9.00	.83	10.96	10.00	1.14	.....	1.14	1.00	2.02	2.72	a.23	*2.95	3.29	{35.00 {.....
10.62	9.00	1.01	11.63	10.00	.87	.....	.87	1.00	1.33	1.85	a.14	1.99	1.65	26.00
9.63	8.00	1.13	10.76	9.00	1.34	.....	1.34	1.00	1.58	2.01	a.14	2.15	2.06	30.00
10.51	9.00	.92	11.43	10.00	1.32	.....	1.32	1.00	1.04	1.51	a.27	1.78	1.65	24.00
8.62	8.00	1.71	10.33	9.00	1.10	.....	1.10	1.00	1.61	2.00	a.22	2.22	2.06	28.00
11.69	10.00	.89	12.58	11.00	.84	.....	.84	1.00	.92	1.28	a.12	1.49	1.23	{26.00 {26.50
10.72	9.00	1.01	11.73	10.00	.53	.73	1.26	1.00	1.11	1.61	a.19	1.80	1.65	25.50
11.29	8.00	.89	12.18	9.00	1.48	.....	1.48	1.00	1.10	1.79	a.32	2.11	2.06	31.00
10.70	10.00	1.34	12.04	11.00	1.06	.....	1.06	1.00	.48	.83	a.22	1.05	.82	24.75
10.79	9.00	1.11	11.90	10.00	1.18	.....	1.18	1.00	1.29	1.72	a.24	1.96	1.65	26.25
8.70	8.00	1.18	9.88	9.00	1.02	.....	1.02	1.00	.35	.65	b.23	.88	.82	23.00
11.01	9.00	.92	11.93	10.00	1.02	.....	1.02	1.00	.99	1.43	a.13	*1.56	2.47	.....
9.49	9.00	1.78	11.27	10.00	1.28	.....	1.28	1.00	1.02	1.21	b.24	1.45	1.23	24.75
9.73	8.50	1.25	10.98	9.50	.97	.....	.97	1.00	1.04	1.47	a.19	1.66	1.65	{27.00 {25.00
8.52	8.00	1.99	10.51	9.00	1.92	.....	1.92	1.00	.55	.66	c.24	.90	.82	{29.00 {24.25 {23.00
8.26	8.00	1.28	9.54	8.50	2.30	.....	2.30	2.00	.73	1.12	b.47	1.59	1.65	{34.00 {35.00
8.61	8.00	.68	9.29	8.50	2.20	.....	2.20	2.00	2.22	2.78	b.43	3.21	3.29	{40.00 {40.00
8.76	8.00	.47	9.23	8.50	.96	.....	.96	1.00	1.69	2.10	b.36	2.46	2.47	{31.00 {24.00 {30.00
8.18	8.00	1.29	9.47	8.50	1.36	.....	1.36	1.00	.59	1.16	b.53	1.69	1.65	{27.00 {27.34 {27.50
7.23	7.00	.50	7.73	7.50	1.02	.....	1.02	1.00	.46	.62	b.19	.81	.82	{27.00 {23.75 {24.50
*9.30	10.00	1.30	10.60	.....	.52	.....	.52	.25	.29	.....	.....	.48	.21	20.00
8.87	8.00	2.73	11.60	.....	.88	.....	.88	.50	.66	1.03	a.22	1.25	1.02	26.00
8.70	7.00	2.11	10.81	.....	.46	.....	.46	.25	.31	.53	b.15	.65	.41	22.00
9.86	9.00	2.14	12.00	.....	.93	.....	.93	1.00	1.02	1.42	b.32	1.74	1.65	{28.00 {27.00
*7.73	8.00	1.56	9.29	.....	.74	.....	.74	.50	.38	.50	b.14	.64	.41	{20.00 {19.50 {24.00

a, b, c. Characters indicating the proportion of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	BAUGH & SONS CO., PHILADELPHIA, PA., Continued.		
333	†Baugh's Complete Animal Base Fertilizer,	H. A. Smith, Lehighton,	7.45
179		J. Watson Craft, Ambler,	
877		B. & J. T. Copey, Scranton,	
524	†Baugh's Excelsior Guano,	E. H. Keen & Co., Parkesburg,	8.31
233		N. H. Blough, Davidsville,	
682		J. G. Brubaker, Richfield,	
1550	Baugh's Grand Rapid High Grade Guano,	Nathan Shaffer, Luthersburg,	6.35
202	†Baugh's High Grade Potato Grower,	W. E. Erwin, Somerton,	5.38
667	Big "Potato" Brand.	S. K. Mohr, Coopersburg,	
670	Baugh's Peruvian Guano, Substitute for Potatoes and all Vegetables.	S. K. Mohr, Coopersburg,	6.80
283	Baugh's Potato and Truck Special for all truck crops.	Henry Wurtz & Son, Washington-boro.	6.93
522	†Baugh's Special Potato Manure,	W. H. Toglesonger, Shippensburg,	7.60
521		J. C. Emery, Nottingham,	
617		John Phelps, Sugar Grove,	
	THE BERG CO., PHILADELPHIA, PA.		
212	New Standard Bone Manure,	Harry M. Myers, Doylestown,	9.20
	BOWKER FERTILIZER CO., NEW YORK CITY.		
1336	Bowker's All 'Round Fertilizer, 1916,	F. A. Shelander & Son, Marvindale,	7.34
913	†Bowker's Potato Phosphate, 1916,	H. L. Stultz & Bro., Altoona,	8.87
1083		Harvey L. Moses, Chester Springs,	
618	†Bowker's Staple Phosphate, 1916,	C. H. Sauders, Sugargrove,	5.17
715		Mars Mfg. & Feed Co., Mars,	
1227	Stockbridge's General Crop Manure, 1916,	J. A. Stoll & Co., Kane,	4.63
	THOMAS FERTILIZER WORKS, CENTRAL CHEMICAL CO., HAGERSTOWN, MD.		
814	C. C. C. Phoenix,	Ross Snyder, Friedens, R. No. 2,	4.40
	CHESAPEAKE CHEMICAL CO., BALTIMORE, MD.		
1572	C. C. Co's. Dissolved Guano,	L. R. Owen, Curryville,	3.12
	COE MORTIMER CO., NEW YORK.		
263	†E. Frank Coe's Corn King, 1916,	Vineyard Supply Co., North East,	6.96
817		Adolf Boettinger, Danville,	
736		I. W. Scott & Co., Pittsburgh,	6.58
168	†E. Frank Coe's Gold Brand Excelsior Guano, 1916.	Adolf Boettinger, Danville,	
973		E. A. Bertholomew, Saylorsburg,	
121	E. Frank Coe's Morco Top Dresser, 1916.	Chas. Schoffstall, Valley View,	7.54
770	†E. Frank Coe's New Englander Special, 1916.	F. F. Harrison Edinboro,	7.44
123		Chas. Schoffstall, Valley View,	
975		E. A. Bertholomew, Saylorsburg, R. No. 1.	
	COLUMBIA GUANO CO., BALTIMORE, MD.		
482	Columbia Growmore Compound,	John Cook, Buckingham,	8.32
793	†Columbia Wheat, Corn and Grass Special Fertilizer.	C. H. Schmucker, Friedens,	6.27
483		John Cook, Buckingham,	
893		Wm. F. Miller, Lamar,	
	CONSUMERS CHEMICAL CORPORATION, NEW YORK CITY.		
1499	Consumers Pure Sure Plant Food,	Murry & Co., Honesdale,	8.92
449	†Consumers Pure Sure Potato and Vegetable with 2% Potash.	Eli Martin, New Holland,	5.46
870		Lester Tompson, Clarks Summit,	
	JAS. G. DOWNWARD CO., COATESVILLE, PA.		
209	Ammoniated Phosphate,	Isaac Tomlinson, Huntingdon Valley,	5.33
207	1916 Pioneer Potato Manure,	Isaac Tomlinson, Huntingdon Valley,	7.03
208	Potato, Corn and Grain Special,	Isaac Tomlinson, Huntingdon Valley,	9.79

†Composite sample.

LIZERS—Continued

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
Available.			Total.				Total.					Total.		
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Water soluble.	Available.	Inactive insoluble.	Found.	Guaranteed.	
11.17	10.00	1.43	12.60	.....	1.06	.....	1.06	1.00	1.00	1.41	b.32	1.73	1.65	$26.50 / 29.00 / 28.50
10.55	10.00	2.01	12.56	.....	1.32	.....	1.32	1.00	.95	1.17	b.24	1.41	1.02	$26.00 / 24.35 / 23.75
9.06	9.00	1.15	10.21	.....	1.00	.....	1.00	1.00	2.19	2.56	b.33	2.89	2.47	31.50
9.78	8.00	.92	10.70	.....	.53	.63	1.16	1.00	2.27	2.71	b.38	*3.09	3.30	$36.00 / 34.00
9.55	8.00	.89	10.44	.....	1.12	.....	1.12	1.00	2.57	2.94	b.40	*3.34	4.12	36.00
10.80	10.00	1.59	12.39	.....	1.07	.46	1.53	1.00	1.77	2.20	b.43	*2.63	2.88	40.00
9.82	10.00	2.21	12.04	.....	.93	.....	.93	1.00	.84	1.15	b.45	1.60	1.65	$30.00 / 28.50 / 30.00
10.05	8.00	2.23	12.28	11.00	1.66	.....	1.66	1.25	1.53	2.14	b.54	*2.68	3.00	.....
11.55	10.00	.61	12.17	11.00	1.18	.....	1.18	1.00	1.58	1.98	a.08	2.06	2.06	33.50
11.34	10.00	1.24	12.58	11.00	.93	.....	.93	1.00	1.24	1.61	a.14	1.75	1.65	$30.00 / 29.75
9.19	8.00	1.45	10.64	9.00	.80	.....	*.80	1.00	.39	.64	b.18	.82	.82	$27.50 / 27.00
10.89	9.00	.34	11.23	10.00	1.12	.....	1.12	1.00	2.77	3.18	a.10	3.28	3.29	40.00
8.61	8.00	.50	9.11	.....	.90	.....	.90	.50	.48	.....	.....	.68	.41	18.65
8.96	7.00	1.70	10.66	7.50	.34	.....	.34	.25	.33	.59	c.47	1.00	.82	19.50
11.25	10.00	1.15	12.40	11.00	1.24	.....	1.24	1.00	2.51	2.86	a.10	2.96	2.06	$30.00 / 31.00
10.24	9.00	1.08	11.32	10.00	.90	.....	.90	1.00	2.00	2.52	a.12	2.64	2.47	$38.00 / 33.00 / 29.50
6.61	5.00	.60	7.21	6.00	1.49	.....	1.49	1.00	5.59	6.45	a.32	*6.77	8.23	50.55
8.84	8.00	1.12	9.96	9.00	.93	.....	.93	1.00	.62	.85	a.13	.98	.82	$25.50 / 22.80 / 24.00
8.10	8.00	1.31	9.41	8.50	1.32	.....	1.32	1.00	.93	1.29	b.48	1.77	1.65	27.75
8.40	8.00	.91	9.31	8.50	1.10	.....	1.10	1.00	.60	.85	b.13	1.01	.82	$23.00 / 24.75 / 23.25
9.32	8.00	.66	9.98	9.00	.53	.91	1.44	1.00	.54	.82	a.09	.91	.82	27.00
10.15	8.00	1.43	11.58	9.00	.93	1.47	2.40	2.00	2.34	2.64	b.69	3.33	3.29	$40.00 / 35.00
*7.70	8.00	.85	*8.55	9.00	.66	.....	.66	.50	.39	.72	b.32	1.04	.41	24.00
*7.47	8.00	.93	*8.40	9.00	1.25	.....	1.25	1.00	2.07	2.41	b.35	2.76	2.47	34.00
*7.47	8.00	1.16	*8.63	9.00	1.28	.....	1.28	1.00	1.27	1.46	a.08	1.54	1.65	29.00

a, b, c. Characters indicating the proportions of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	DUNGAN FERTILIZER CO., DOYLESTOWN, PA.		
216	Potato Manure,	Dungan Fert. Co., Doylestown,	11.63
	ERIE REDUCTION CO., ERIE, PA.		
252	General Crop Special,	W. D. Ripley, Wesleysville,	5.08
	EUREKA CHEMICAL CO., BALTIMORE, MD.		
536	†Eureka Fish and Potash,	John Tailor, Shippensburg,	4.41
10		E. H. Frick, York, R. No. 8,	
685		A. P. Dumms, Thompsontown,	
	FARMERS' FERTILIZER WORKS, ELIZABETHTOWN, PA.		
274	†High Grade,	H. M. Baer & Son, Salunga,	9.87
1288		Addison Landis, Middletown,	
440	Pride of Douegal,	H. H. Martin, Manheim,	10.92
	W. S. FARMER & CO. (AM. AG. CHEM. CO., NEW YORK).		
6	W. S. Farmer & Co. Branch Clyde Brand, 1916.	E. A. Bear, York, R. No. 8,	8.27
4	W. S. Farmer & Co. Branch Pelican Guano, 1916.	E. A. Bear, York, R. No. 8,	8.06
	GRIFFITH & BOYD CO., BALTIMORE, MD.		
190	Farmers' Potato and Tomato,	S. H. Chambers & Bro., Elkview,	10.66
	S. M. HESS & BRO., PHILADELPHIA, PA.		
757	Big Crop Fertilizer, 1916,	Alfred Fritzinger, Sittlers,	7.47
472	Farmers' General Fertilizer, 1916,	C. W. Book, Mexico,	10.41
466	†Keystone Phosphate,	Wm. Peffenberger, Mifflinburg,	8.17
225		Moses Weaver, Johnstown, R. No. 4,	
585		H. M. Hostetter, Campbelltown,	
961	Potato Manure, 1916,	Edwin Wagner, Hellertown,	7.78
775	†Special Corn Manure, 1916,	A. L. Veit, McKean,	8.58
581		H. M. Hostetter, Campbelltown,	
952		Chas. Tressler, Conyngham,	
776	†Wheat and Grass Manure, 1916,	A. L. Veit, McKean,	5.81
1036		W. F. Hafer, New Columbia,	
	P. HOFFMAN & BRO., RAUBSVILLE, PA.		
493	Hoffman's Grain and Corn,	P. Hoffman & Bro., Raubsville,	3.58
494	Hoffman's Potato and Truck,	P. Hoffman & Bro., Raubsville,	3.39
	HUBBARD FERTILIZER CO., BALTIMORE, MD.		
358	†Hubbard's Columbia Phosphate,	C. H. Schmucker, Friedens,	8.96
134		Wm. Schadle, Pillow, R. D.,	
844	†Hubbard's Farmers' Phosphate,	J. Emery Mone, Iron Ore,	5.95
991		J. C. Lieb & Co., Stewartstown,	
1414		Hartley & Blaine, Turbotville,	
	M. P. HUBBARD & CO., BALTIMORE, MD.		
1072	†Hubbard's Big Jim Compound,	P. W. G. Baker, Elizabethtown,	5.07
1241		F. E. Neffe & Co., Coudersport,	
1073	†Hubbard's Domino Compound,	P. W. G. Baker, Elizabethville,	8.89
1242		F. E. Neffe & Co., Coudersport,	
201	†Hubbard's Good and Cheap,	M. J. Sheffer, Hanover,	7.70
1243		F. E. Neffe & Co., Coudersport,	
	INTERNATIONAL AGRICULTURAL CORPORATION, BUFFALO FERTZ. WKS., BUFFALO, N. Y.		
352	Buffalo Garbage Tankage,	Edward Fracier, Shanksville,	5.33
1340	Buffalo High Grade Manure,	Victor Lantz, Mt. Jewett,	5.65

†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
Available.			Total.				Total.					Total.		
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Water soluble.	Available.	Inactive insoluble.	Found.	Guaranteed.	
8.32	7.00	2.95	11.27	9.00	1.16	.....	1.16	1.60	1.15	1.68	a.30	1.98	2.07	34.00
8.25	7.00	1.03	9.28	9.00	1.23	.....	1.23	1.00	.29	.69	b.59	1.28	1.23	24.70
8.50	8.00	.54	9.04	8.50	.55	.....	.55	.25	.32	.46	b.17	.63	.41	18.00 19.50 .....
9.83	8.00	.93	10.76	9.00	1.96	.....	1.96	1.00	2.03	2.56	b.64	3.23	3.28	33.00 32.00
8.46	7.00	1.11	9.57	8.00	1.92	.....	1.92	1.00	1.23	1.73	b.70	2.42	2.47	24.00
9.30	8.00	1.24	10.54	9.00	1.02	.....	1.02	1.00	.64	.84	b.17	1.01	.82	22.50
8.07	8.00	1.43	9.50	9.00	1.10	.....	1.10	1.00	.53	.....	.....	.66	.41	20.20
9.50	8.00	1.48	10.98	9.00	1.32	.....	1.32	1.00	.37	.72	b.40	1.12	1.25	28.00
11.52	10.00	1.05	12.57	11.00	.82	.....	.82	1.00	.93	1.42	a.21	1.63	1.65	30.50
11.09	10.00	1.21	12.30	11.00	.94	.....	.94	1.00	.55	.70	b.14	.84	.82	.....
8.66	8.00	1.28	9.94	9.00	1.08	.....	1.08	1.00	.73	.93	a.08	1.01	.82	..... 23.50 .....
10.14	9.00	1.00	11.14	10.00	1.10	.....	1.10	1.00	1.56	2.20	a.22	2.42	2.47	28.00
10.40	9.00	1.31	11.71	10.00	.88	.....	.88	1.00	.55	.90	a.10	1.00	.82	26.00 ..... 23.00
10.85	9.00	1.49	12.34	10.00	.96	.....	.96	1.00	.59	.83	a.14	.97	.82	26.00 23.75
9.91	7.00	3.06	12.97	10.00	.93	.....	.93	1.00	.45	.77	b.30	1.07	.82	24.00
8.70	7.00	4.31	13.01	10.00	.96	.....	.96	1.00	.72	1.01	b.23	1.24	.82	28.00
9.22	8.00	1.73	10.95	8.75	.70	.....	.70	.50	.48	.82	b.24	1.06	.82	22.00 21.00 21.00
8.60	7.00	.94	9.54	7.50	.30	.....	.30	.25	.27	.50	c.49	.99	.82	17.50 20.50
8.91	8.00	.71	9.62	9.50	1.36	.....	1.36	1.00	.22	.32	c.25	.57	.41	22.00 26.50
9.48	8.00	.57	10.05	9.50	1.52	.....	1.52	1.00	.71	1.14	b.57	1.71	1.65	27.00 31.50
9.16	8.00	.66	9.82	9.50	1.32	.....	1.32	1.00	.61	.86	b.30	1.16	.82	24.50 28.50
.....	.....	.....	*3.32	4.00	1.48	.....	1.48	.75	.59	1.19	c1.40	2.58	2.30	19.00
8.97	8.00	.56	9.53	.....	1.04	.....	1.04	1.00	2.26	3.29	a.62	3.91	3.30	35.25

a, b, c. Characters indicating the proportions of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	JARECKI CHEMICAL CO., SANDUSKY, O.		
87	†Lake Erie Guano with Phosphate and Potash.	Clark Bros., Oil City,	9.90
1129		S. S. Mosholder, Rockwood,	
781	Little Giant,	Chas. C. Good Co., North Girard,	2.54
1133	Number One Formula,	S. S. Mossholder, Rockwood,	8.22
	KEYSTONE BONE FERTILIZER CO., PHILADELPHIA, PA.		
334	1916 Keystone Corn and Cereal Grower,	Kemerer Hdw. Co., Lehighton,	9.99
1098	1916 Keystone General Manure,	Wm. M. Harbert, Warriugton,	12.40
1289	1916 Keystone High Grade Truck Guano,	R. J. Walton, Hummelstown,	8.12
	KEYSTONE GRANGE EXCHANGE, MANSFIELD, PA.		
325	Grangers' Best Mixture,	I. E. Artz, Sec., Hegins Grange, Hegins.	10.41
349	Grangers' Special Crop Grower,	J. A. Blough, Hollsopple, R. No. 1,	7.40
	KOLLER FERTILIZER CO., SEITZLAND, PA.		
103	Koller's Ammoniated Phosphate,	J. W. Sheffer, Red Lion, R. No. 2,	10.60
102	Koller's Electric,	J. W. Sheffer, Red Lion, R. No. 2,	12.30
100	Koller's Potato Grower Phosphate,	J. W. Sheffer, Red Lion, R. No. 2,	10.01
	LANCASTER BONE FERTILIZER CO., LANCASTER, PA.		
282	Connecticut Tobacco Wrapper Grower,	Henry Wertz & Son, Washingtonboro,	6.35
105	Potato, Fruit and Vegetable,	Josiah Flinchbaugh, Winson,	3.55
918	Potato, Tobacco and Truck Manure.	Ira Bechtel, Roaring Springs,	5.40
	LANCASTER CHEMICAL CO., LANCASTER, PA.		
1575	No. 1 Tobacco and Vegetable,	D. W. Williams, Willow Street,	6.38
653	No. 2, Dewey Brand,	Chas. Harting, Lynnport,	7.93
567	†No. 19 Potato Special,	J. L. Royer, Myerstown,	
446		E. B. Ruhl & Son, Manheim,	8.32
654		John Kuntz, Lynnport,	
	LEBANON FERTILIZER WORKS, LEBANON, PA.		
1349	Levan's Potato and Tobacco Fertilizer,	Mr. Fisher, Yellow House,	6.52
758	†Levaus Special Corn Fertilizer,	C. F. Snyder, Tamaqua,	4.64
1276		W. A. Bailets, Dauphin,	
	LISTER'S AGRICULTURAL CHEMICAL WORKS, NEWARK, N. J.		
294	†Lister's Corn and Potato Fertilizer, 1916,	J. C. Ernst & Co., York,	
186		W. E. Erwin, Somerton,	6.48
455		L. D. Brackbill, Kinzer,	
1411	Lister's Pennsylvania Special, 1916,	Benj. Savidge, Turbotville,	9.83
788	Lister's Potato and Corn No. 2 Fertilizer, 1916.	J. R. Hanks, Springboro,	10.27
187	Lister's Potato Manure, 1916,	W. E. Erwin, Somerton,	11.02
428	†Lister's Special Crop Producer, 1916,	Jacob Bonser, St. Clairville,	
291		J. C. Ernst & Co., York,	7.75
1095		Wm. F. Fritz, Berwyn,	
270	Lister's Special Tobacco Fertilizer, 1916,	Eli Witmer, Lampeter,	8.69
709	†Lister's Success Fertilizer, 1916,	Morrow & Buxton, Valencia,	
454		L. D. Brackbill, Kiuzer,	10.07
786	†Lister's U. S. Super Phosphate, 1916,	J. R. Hanks, Springboro,	
1094		Wm. Fritz, Berwyn,	6.74
1412	Lister's Valley Brand Fertilizer, 1916,	Benj. Savidge, Turbotville,	
1430		J. T. Murphy, Clearfield,	9.66

†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
Available.			Total.				Total.					Total.		
Found.	Guarantee.	Insoluble.	Found.	Guarantee.	Present as muriate.	Present as sulphate.	Found.	Guarantee.	Water soluble.	Available.	Inactive insoluble.	Found.	Guarantee.	
9.57	9.00	1.19	10.76	10.00	.80	.44	1.24	1.00	.68	1.03	b.25	1.28	1.25	$29.40 24.75
7.55	7.00	.84	8.39	8.00	1.04	.....	1.04	1.00	.56	.84	a.18	1.02	.83	24.00
9.35	9.00	1.35	10.70	10.00	.69	.....	*.69	1.00	.48	.63	c.25	.88	.82	23.25
8.26	8.00	1.20	9.46	9.00	2.30	.....	2.30	2.00	.88	1.31	b.50	1.81	1.65	32.00
9.53	8.00	.88	10.41	9.00	1.32	.....	1.32	1.00	.92	1.16	b.38	1.54	1.23	28.00
8.90	.....	1.13	10.03	.....	.37	.....	.37	.....	2.93	3.81	a.39	4.20	.....	.....
8.83	8.00	1.46	10.29	9.00	2.40	.....	2.40	2.00	1.39	1.53	c.23	1.76	1.65	30.00
8.90	9.00	2.23	11.13	10.00	1.20	.....	1.20	1.00	.53	.68	c.26	.94	.82	24.00
9.53	8.00	.89	10.42	9.00	1.08	.....	1.08	1.00	.33	.52	b.27	.79	.82	20.00
10.46	9.00	.70	11.16	10.00	1.00	.....	1.00	.50	.15	.21	c.20	.41	.42	16.75
8.54	7.00	.47	9.01	8.00	1.75	.....	1.75	1.50	.52	.83	b.35	1.18	.82	22.00
8.34	8.00	.29	*8.63	9.00	.67	1.77	*2.74	3.00	.85	1.12	c.45	1.57	1.60	44.00
*6.38	7.00	1.67	8.05	8.00	1.24	.....	1.24	1.00	.47	.86	b.43	1.29	.82	.....
7.93	8.00	1.52	9.45	9.00	1.62	.....	1.62	1.00	.88	1.22	b.40	1.62	1.60	28.00
*6.61	7.50	1.30	*7.91	8.50	2.48	.....	2.48	1.00	.81	1.48	b.56	2.04	2.06	.....
8.76	8.00	.86	9.62	9.00	1.08	.....	1.08	1.00	.67	1.02	a.20	1.22	1.23	23.00
9.82	9.00	1.36	11.18	10.00	.53	.49	1.02	1.00	.91	1.32	a.19	1.51	1.65	..... 27.00 26.00
*9.71	10.00	1.35	11.06	11.00	1.44	.....	1.44	1.00	1.49	1.88	b.31	2.19	1.64	.....
8.17	8.00	.98	9.15	9.00	2.20	.....	2.20	2.00	.56	.77	b.34	1.11	.82	$29.00 32.40
9.05	8.00	1.17	10.22	9.00	1.08	.....	1.08	1.00	1.82	2.25	a.07	2.32	2.06	$32.00 30.00 27.00
9.99	9.00	1.38	11.37	10.00	1.24	.....	1.24	1.00	.72	.86	a.07	.93	.82	24.00
10.80	10.00	2.03	12.83	11.00	.98	.....	.98	1.00	2.25	2.71	a.28	2.99	2.06	31.00
8.75	8.00	.89	9.64	9.00	1.07	.37	1.44	1.00	2.39	3.66	a.54	4.20	4.11	38.00
8.66	8.00	1.08	9.74	9.00	1.18	.....	1.18	1.00	.60	.78	b.14	.92	.82	$22.85 26.00 28.00
11.65	10.00	.93	12.58	11.00	.71	.....	*.71	1.00	1.37	2.06	a.28	2.34	2.06	28.00
11.78	10.00	.88	12.66	11.00	.90	.....	.90	1.00	.87	1.14	a.07	1.21	1.23	$28.00 25.00 27.50
11.59	10.00	1.03	12.62	11.00	1.00	.....	1.00	1.00	.82	1.11	a.12	1.23	1.22	$32.00 25.75
11.24	10.00	1.73	12.97	11.00	1.06	.....	1.06	1.00	.69	.86	a.07	.93	.82	28.00

a, b, c. Characters indicating the proportions of insoluble nitrogen that is inactive; a=2/5 or more; b=2/5 to 3/5; c=3/5 or more.
*Constituent falls below guaranty.

Sample number.	Manufaeturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	MAPES FORMULA & PERUVIAN GUANO CO., NEW YORK.		
433	Mapes' Corn Mauure, War Brand, ...	W. H. Muth & Co., Lititz, ...	9.56
285	Mapes' General Special, War Brand, ...	Jos. K. Shultz, Washingtonboro, ...	6.32
286	Mapes' Potato Manure, War Brand, ...	Jos. K. Shultz, Washingtonboro, ...	6.37
284	Mapes' Tobacco Starter, Improved, ...	Jos. K. Shultz, Washingtonboro, ...	6.33
287	Mapes' Tobacco Manure, War Braud, ...	Jos. K. Shultz, Washingtonboro, ...	7.74
767	Mapes' Top Dresser, Full Strength, War Brand.	A. F. Kemmel, Orwigsburg, ...	5.66
	MARTIN FERTILIZER CO., PHILADELPHIA, PA.		
192	†Martin's Bull Head Fertilizer, ...	S. K. Chambers & Bro., Elkview, ..	6.18
639		Edwin Houck, Banger.	
1294	Martin's Early Truck & Vegetable Grower,	Lebanon Hdw. Co., Lebanon, ...	8.06
	MILLER FERTILIZER CO., BALTIMORE, MD.		
530	†Club Brand, ...	C. C. Oiler, Carlisle, ...	4.99
305		Humbert & Krug, Littlestown, ...	
822		Jos. A. Gass, Sunbury, ...	
269	Potato and Vegetable Grower, ...	Eli Witmer, Lampeter, ...	7.29
	NASSAU FERTILIZER CO., NEW YORK.		
940	Nassau Special, 1916, ...	Lewis Huste, Dallas, ...	9.40
950	†Wheat and Grass Grower, 1916, ...	Philip Miller, Nescopeck, ...	9.48
978		Harry Stoffiet, Sciota, ...	
	NITRATE AGENCIES CO., NEW YORK.		
865	†High Grade Genuine Peruvian Guano, ...	H. G. Leighton, Tunkhannock, ...	17.49
62		B. H. Buckwalter, West Willow, ..	
994		J. C. Lieb & Co., Stewartstown, ..	
	G. OBER & SONS CO., BALTIMORE, MD.		
986	Obers Red King Guano, ...	Summit Lumber Co., New Freedom,	7.99
	PATAPSCO GUANO CO., BALTIMORE, MD.		
16	†Coon Brand Guano, 1916, ...	J. M. Flinchbaugh, Windsor, ...	8.53
416		Francis Baker, Everett, ...	
881	Patapsco Columbian Guano for Truck, Potatoes, Tobacco, 1916.	Weeks Hdw. Co., Scranton, ...	8.66
576	Patapsco Corn and Tomato Fertilizer, 1916,	Jos. Burkholder, Hummelstown, ...	10.41
927	Patapsco Money Maker, 1916, ...	F. P. Waite Co., Tyrone, ...	8.77
827	Patapsco Special Early Trucker, 1916, ...	W. H. Diehl, Northumberland, R. No. 1.	6.81
1398	Patapsco Speeial Potato Manure, 1916, ...	A. R. Whitenoyer, Unityville, ...	7.38
	J. D. PERKINS, COATESVILLE, PA.		
503	Perkins' Special Bono Manure, ...	Jerome Tingley, Coatesville, ...	9.07
	PITTSBURGH PROVISION & PACKING CO., PITTSBURGH, PA.		
348	†Pure Bone with Potash, ...	J. Z. Rhoads Club, Agt., Stoystown, R. No. 1.	6.72
739		Geo. Renton & Co., Castle Shaunon.	
	POLLOCK FERTILIZER CO., BALTIMORE, MD.		
22	†The Pollock Fertilizer Co. Corn and Oats Special, 1916.	S. A. Barshinger, Red Lion, ...	7.10
415		Franels Baker, Everett, ...	
118	†The Pollock Fertilizer Co. Corn, Wheat and Tomato Guano. 1916.	J. W. Gable, Hellam, ...	8.27
1259		H. M. Owens & Son, Lewistown, ..	
23	The Pollock Fertilizer Co. Special Potato and Tobacco Fertilizer, 1916.	S. A. Barshinger, Red Lion, ...	7.91

†Composite sample.

LIZERS—Continued

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
Available.			Total.				Total.					Total.		
Found.	Guarantee.	Insoluble.	Found.	Guarantee.	Present as muriate.	Present as sulphate.	Found.	Guarantee.	Water soluble.	Available.	Inactive insoluble.	Found.	Guarantee.	
10.37	8.00	1.60	11.97	10.00	1.50	.....	1.50	1.00	1.66	2.16	b.53	2.69	2.47	34.00
7.89	6.00	1.20	9.09	8.00	.67	1.10	1.77	1.00	5.03	5.53	b.58	6.11	5.76	46.00
9.30	8.00	.98	10.28	10.00	.53	.65	1.18	1.00	3.30	3.63	b.41	4.04	3.71	42.00
6.52	6.00	2.68	9.20	8.00	.67	.83	1.50	1.00	2.68	3.66	b.97	4.63	4.12	40.00
7.50	5.00	1.35	8.85	8.00	1.07	.52	1.59	1.00	5.23	7.21	a1.09	8.30	8.23	55.00
7.27	5.00	.93	8.20	8.00	1.33	.22	1.55	1.00	9.37	9.61	a.17	9.78	9.87	60.00
9.41	8.00	1.58	10.99	.....	.70	.....	*.70	1.00	2.09	2.57	a.29	2.86	2.47	28.00 .....
8.88	8.00	1.38	10.26	.....	1.62	.....	1.62	1.00	2.50	2.87	b.31	3.18	3.30	36.00
8.58	8.00	.29	8.87	8.30	.74	.....	.74	.50	.25	.36	c.23	.59	.41	..... 19.50 23.00
8.73	8.00	.92	9.65	8.50	1.06	.....	1.06	1.00	.99	1.35	b.37	1.72	1.65	27.00
10.17	9.00	.75	10.92	10.00	.67	.79	1.46	1.00	1.96	2.41	b.30	2.71	2.47	32.25
9.35	8.00	1.18	10.53	9.00	.90	....	.90	1.00	.79	.94	a.12	1.06	.82	....
11.56	11.00	.37	11.93	.....	2.76	.....	2.76	2.50	3.97	6.35	c4.16	10.51	10.69	75.00 83.00 87.00
8.62	8.00	1.62	10.24	9.00	.67	.97	1.64	1.00	1.86	2.41	b.49	2.90	2.47	28.50
9.63	9.00	1.31	10.94	10.00	1.12	.....	1.12	1.00	.66	.83	b.14	.97	.82	23.00 23.50
11.12	9.00	.64	11.76	10.00	1.06	.....	1.06	1.00	1.61	2.12	a.26	2.38	2.47	36.00
11.58	10.00	.89	12.47	11.00	1.06	.....	1.06	1.00	.85	1.09	a.10	1.19	1.23	25.00
9.20	8.00	1.24	10.44	9.00	1.04	.....	1.04	1.00	.69	.84	a.08	.92	.82	23.50
8.83	8.00	.55	9.38	9.00	2.18	.....	2.18	1.00	2.67	3.25	a.30	3.55	4.11	38.00
10.50	10.00	1.29	11.79	11.00	1.46	.....	1.46	1.00	1.23	1.76	a.17	1.93	1.65	28.75
7.98	8.00	1.34	9.32	.....	1.16	.....	1.16	1.00	.61	.83	b.16	.99	.82	28.00
11.60	7.00	4.48	16.08	14.00	1.75	.....	1.75	.50	.55	1.53	b.83	2.36	2.46	32.60 33.00
8.70	8.00	1.20	9.90	9.00	1.36	.....	1.36	1.00	.49	.....	.....	.64	.41	21.50 22.00
9.22	8.00	1.04	10.26	9.00	1.10	.....	1.10	1.00	.61	.78	b.12	.90	.82	25.00 25.50
9.10	8.00	1.69	10.79	9.00	1.00	.....	1.00	1.00	1.74	2.10	a.13	2.23	2.06	28.00

a, b, c. Characters indicating the proportions of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	RASIN MONUMENTAL CO., BALTIMORE, MD.		
263	†Rasin's Empire Guano,	Vineyard Supply Co., North East,	7.99
848		J. T. Gemmell, Woodbine,	
810	Rasin's Half and Half Special,	Bradford & Son, Centre Hall,	6.14
471	†William Penn Crop Grower,	W. W. Book, Port Royal,	9.15
406		Aspers Milling & Produce Co., Aspers.	
523		E. H. Keen & Co., Parksburg,	
	R. A. REICHARD, ALLENTOWN, PA.		
319	†Farmers' Choice Phosphate,	Monroe Savidge, Hegins, R. D.,	3.57
633		John Kuntzman, Hellertown,	
634	Gilt Edge Phosphate,	John Kuntzman, Hellertown,	6.44
631	Special Manure,	John Kuntzman, Hellertown,	7.24
	REICHARD HIDE & TALLOW CO., ASHLAND, PA.		
1533	Farmers' Jewel,	Ruchland Hide & Tallow Co., Ashland.	5.15
1417	Reichard's Special,	Fred Craig, Catawissa,	7.60
	F. S. ROYSTER GUANO CO., BALTIMORE, MD.		
135	†Royster's Cuckoo Crop Grower,	H. P. Clark, Klingerstown,	6.07
48		Merton E. Haines, Pleasant Grove,	
221		Weaver & Berkey, Windber,	
1189	Royster's Defender Fertilizer,	Thos. O'Connell, Montrose,	7.64
330	Royster's Drillwell Phosphate,	Thos. Kintzleman, Tower City, R. F. D.	7.87
329	†Royster's Logical Compound,	Thos. Kintzleman, Tower City, R. F. D.	7.55
224		Weaver & Berkey, Windber,	
886		John Slocum, Clifford,	
1491	Royster's Old Faithful Phosphate,	W. H. Dunlap, Jr., Canonsburg,	7.08
	SCOTT FERTILIZER CO., ELKTON, MD.		
58	Scott's Potato Grower,	W. G. Mellinger & Bro., Willow, R. No. 1.	10.41
60	Scott's Potato and Truck,	W. G. Mellinger & Bro., Willow, R. No. 1.	7.69
59	Scott's Sure Growth Superphosphate,	W. G. Mellinger & Bro., Willow, R. No. 1.	7.29
	SMITH AGRICULTURAL CHEMICAL CO., COLUMBUS, OHIO.		
785	Smith's Ammoniated Phosphate and Potash,	C. R. Forks, Albion,	6.82
	SWACK'S FERTILIZER WORKS, INC., DUBOIS, PA.		
929	†Swack's Corn Special,	H. E. Lutz, Bald Eagle,	4.50
1170		I. W. Gibson, Indiana,	
88	†Swack's Grain Grower,	F. P. Allen, Titusville,	3.39
838		Union Hdw. Co., Mifflinburg,	
245	†Swack's Special Potato,	Acme Milling Co., Corry,	6.01
1039		Peter Hause, New Columbia,	
	SWIFT & CO., BALTIMORE, MD.		
343	†Swift's Pure Diamond K. Grain Grower,	J. A. Blough, Hollsopple, R. No. 1,	5.51
699		J. McCullough, Jr., Kittanning,	
194	†Swift's Pure Truck and Vegetable,	Thos. Haines & Co., Malvern,	4.97
1237		Horn & Devling, Galeton,	
1177	Swift's Pure Diamond A,	Mills Bros., Carbondale,	6.55

†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
Available.			Total.				Total.					Total.		
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found.	Guaranteed.	Water soluble.	Available.	Inactive insoluble.	Found.	Guarantee.	
9.27	8.00	1.53	10.80	9.00	1.88	.....	1.88	2.00	1.34	1.58	a.09	1.67	1.65	$32.50 / 30.50
9.77	8.00	1.36	11.13	9.00	.79	.....	.79	.50	.35	.....	.....	.53	.41	21.00
8.99	8.00	1.54	10.53	9.00	1.26	.....	1.26	1.00	.52	.64	c.22	.86	.82	$23.00 / 25.00 / 24.00
7.51	7.00	.37	7.88	8.00	.80	.44	1.24	1.00	.36	.67	b.31	.98	.82	$23.00 / .....
8.54	8.00	.51	9.05	9.00	.53	1.05	1.58	1.50	.35	.72	b.26	.98	.82	.....
6.45	6.00	.32	*6.77	7.00	1.86	.37	2.23	2.00	1.16	2.63	a.80	3.42	3.28	.....
9.85	8.00	1.09	10.94	10.00	1.50	.....	*1.50	2.00	.32	.89	b.63	1.52	1.64	22.00
*7.40	15.00	1.15	*8.55	17.50	.70	.....	.70	.50	1.32	5.28	a2.20	7.54	3.69	27.00
7.84	8.00	.96	8.80	8.50	1.18	.....	1.18	1.00	.53	.75	b.15	.90	.82	$22.50 / 21.00 / 25.00
8.44	8.00	1.31	9.75	8.50	1.26	.....	1.26	1.00	1.93	2.63	b.65	3.28	3.29	25.00
8.25	8.00	1.26	9.51	8.50	1.44	....	1.44	1.00	1.37	1.84	b.59	2.43	2.47	31.75
8.28	8.00	1.10	9.38	8.50	1.19	.....	1.19	1.00	1.05	1.40	b.38	1.78	1.65	$28.25 / 28.00 / 28.00
9.12	8.00	1.60	10.73	8.50	1.04	.....	1.04	1.00	1.95	2.81	a.39	3.20	2.04	32.00
11.74	10.00	1.73	13.47	.....	1.48	.....	1.48	1.00	1.02	1.45	b.45	1.90	1.65	28.00
10.27	9.00	1.22	11.49	.....	1.16	.....	1.16	1.00	2.13	2.60	a.26	2.86	2.50	31.00
9.80	8.00	2.21	12.01	.....	1.48	....	1.48	1.00	1.12	1.58	b.48	2.06	1.65	27.00
9.34	9.00	.71	10.05	.....	.92	.....	.92	1.00	.41	.60	b.32	.92	.82	26.00
9.68	8.00	.62	10.30	9.00	1.00	.....	1.00	1.00	.53	.64	c.22	.86	.85	$25.00 / 26.00
7.20	7.00	.60	*7.80	8.00	.98	.....	.98	1.00	.37	.51	c.29	.80	.85	$25.00 / 24.00
9.37	8.00	1.12	10.49	9.00	1.20	.....	1.20	1.00	.82	1.18	b.56	1.74	1.65	$29.00 / 27.00
13.48	12.00	1.03	14.51	.....	.92	.....	.92	1.00	.46	.63	b.16	.79	.82	$24.75 / 28.00
8.41	8.00	1.36	9.77	.....	.90	.....	90	1.00	.94	1.30	b.38	1.68	1.65	$26.50 / 23.00
8.13	8.00	.77	8.90	.....	.94	.....	.94	1.00	1.28	1.84	b.68	2.52	2.47	31.25

a, b, c. Characters indicating the proportions of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds
	I. P. THOMAS & SONS CO., PHILADELPHIA, PA.		
144	†Improved Fertilizer,	J. K. Maurer, Pitman,	7.56
1063		Ed. Shuey, Annville, R. No. 2,	
1321	Normal Fertilizer,	McClellan Zinn, Carlisle,	6.33
1105	Tip Top Fertilizer,	T. M. Griffin & Son, Downingtown,	9.44
1493	Truckers High Grade Manure,	T. O. Bachman, Hellertown,	11.13
590	†Victor Potash Fertilizer,	Monroe A. Weik, Kleinfeltersville,	9.52
1401		C. R. Huirer, Millville,	
	TUSCARORA FERTILIZER CO., BALTIMORE, MD.		
621	Tuscarora (2-8-1),	E. T. Abbott, Sugargrove,	6.02
	J. E. TYGERT CO., BALTIMORE, MD.		
1002	Beacon Brand,	C. I. Saylor, Felton,	6.97
560	†Golden Harvest Phosphate, 1916,	J. Brenneman, Lishurn,	8.65
746		D. H. Green, Little Gap,	
175	Popular Phosphate,	Harry McNair, Mechanicsville,	9.25
1071	Prolific Phosphate, 1916,	P. W. G. Raker, Elizahethville,	7.30
954	Quaker Special Fertilizer, 1916,	Emil Freedrich, Conyngham,	9.58
176	Standard Fertilizer, 1916,	Harry McNair, Mechanicsville,	9.88
	VIRGINIA CAROLINA CHEMICAL CO., RICHMOND, VA.		
20	V. C. C. Co's. Champion Manure,	Cal. Dietz, Red Lion,	7.95
1553	V. C. C. Co's. Special Compound for Wheat,	N. H. Diener, Brookville,	7.42
	WARREN FERTILIZER CO., WARREN, PA.		
624	Warren Special Potato and Truck,	Pickett Hdw. Co., Warren,	7.49
	WASHINGTON ALEXANDER & COOK CO., CHARLESTOWN, W. VA.		
398	W. A. & Co's. Wheat, Corn and Oats Mixture.	E. I. Kelly, Gettysburg,	8.12
	W. E. WHANN CO., BY AM. AG. CHEM. CO., NEW YORK.		
11	†Whann's Chester Valley Fish and Potash	W. F. Mundis, York, R. No. 8,	8.07
503	Fertilizer, 1916.	N. T. Sassaman, Ottsville,	
	THE WOOLDRIDGE FERTILIZER CO., BALTIMORE, MD.		
1394	Tiger Phosphate,	Grant Johnson, Millville,	4.99
	ROBERT A. WOOLRIDGE CO., BALTIMORE, MD.		
475	†Woolridge Farmers' Favorite Cereal Com-	J. M. Peterson, Honey Grove,	8.05
857	pound, 1916.	S. H. Shearer, Seven Valley, R. No. 1	
747	†Woolridge Special Potato and Tobacco	J. M. Scott, Montoursville, R. No. 3,	7.27
1119	Fertilizer, 1916.	C. H. Cox & Bro., Phoenixville,	
1120	Woolridge Triumph Brand Phosphate, 1916,	C. H. Cox & Bro., Phoenixville,	7.91
	YORK CHEMICAL WORKS, YORK, PA.		
531	†Dempwolf's Golden Sheaf,	Mt. Holly Feed & Grain Co., Mt. Holly.	5.27
675		W. H. Kramer, McAlisterville,	
112	†Dempwolf's Harvest Queen,	Strayer Bro. Co., York,	3.37
68		Langford Bros., Compass,	
460	†Dempwolf's Plow Brand,	Maurice Leonard, McAlisterville,	4.50
476		J. M. Thompson, Honey Grove,	
1111	Dempwolf's York Special,	Thomas Haines Co., Malvern,	4.88
1361		Frederick & Myers, Mercersburg,	

†Composite sample.

LIZERS—Continued.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
Available.			Total.				Total.					Total.		
Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Present as muriate.	Present as sulphate.	Found	Guaranteed.	Water soluble.	Available.	Inactive insoluble.	Found.	Guaranteed.	
*9.01	10.00	.85	9.86	.....	1.32	.....	1.32	1.00	.72	.89	b.20	1.09	.82	22.00 24.25
8.39	8.50	.84	9.23	9.00	1.00	.....	1.00	1.00	.96	1.37	a.22	1.59	1.00	28.00
9.63	8.00	.85	10.48	8.50	.93	.....	.93	1.00	3.01	3.34	b.28	3.65	2.45	34.00
10.62	8.00	1.95	12.57	8.50	.53	.95	1.48	1.00	1.75	2.73	a.36	3.09	3.25	33.00
12.77	12.00	.94	13.71	12.50	1.00	.....	1.00	1.00	.53	.85	a.20	1.05	.82	..... 25.00
7.85	8.00	.79	9.64	8.50	1.04	.....	1.04	1.00	1.06	1.37	b.37	1.74	1.65	28.70
11.96	10.00	1.19	13.15	11.00	.93	.....	.93	1.00	1.01	1.29	a.14	1.43	1.23	24.25
9.28	8.00	.98	10.26	9.00	1.00	.....	1.00	1.00	.52	.86	a.17	1.69	.82	..... 22.50
8.44	7.00	1.03	9.47	8.00	.82	.....	.82	1.00	.49	.73	a.16	.89	.82	22.00
8.89	8.00	1.20	10.09	9.00	1.16	.....	1.16	1.00	.50	.....	.....	.64	.41	22.00
10.39	10.00	.87	11.26	11.00	1.32	.....	1.32	1.00	1.67	2.22	a.25	2.47	.82	25.25
9.74	9.00	1.15	10.89	10.00	1.14	.....	1.14	1.00	1.21	1.62	a.29	1.84	1.65	27.00
10.00	8.00	1.07	11.07	9.00	1.00	.....	1.00	1.00	.27	.43	b.18	.61	.41	21.40
8.76	8.00	1.63	10.39	9.00	1.28	.....	1.28	1.00	.49	.62	c.25	.87	.82	25.00
9.66	7.00	2.06	11.72	.....	2.38	.....	2.38	2.00	.91	1.43	b.56	1.99	1.46	33.00
9.03	8.00	1.07	10.10	9.00	1.30	.....	1.30	1.00	.....	.....	.....	.48	.41	20.00
10.82	10.00	1.34	12.16	11.00	1.12	.....	1.12	1.00	.....	.....	....	1.76	1.65	28.00 29.50
8.63	8.00	.77	9.40	8.50	.61	.....	.61	.50	.74	.93	b.17	1.10	1.03	24.00
8.97	8.00	1.01	9.98	9.00	1.12	.....	1.12	1.00	.57	.....	.....	.68	.41	23.50 21.00
11.27	10.00	1.28	12.55	11.00	.93	.....	.93	1.00	1.34	1.78	a.12	1.90	1.65	27.50 31.00
11.64	10.00	.82	12.46	11.00	1.02	.....	1.02	1.00	.76	1.18	a.20	1.38	1.23	29.00
8.82	8.00	.41	9.23	8.50	.48	.....	.48	.50	.16	.30	c.29	.59	.29	18.50 18.00
8.15	8.00	.89	9.04	8.50	1.06	.....	1.06	1.00	.43	.66	b.32	.98	.82	23.00 26.00
8.29	8.00	.45	8.74	8.50	.79	.....	*.79	1.00	.63	1.16	b.48	1.64	1.65	..... 27.00
7.98	8.00	.51	8.49	8.50	.72	.....	.72	.50	.21	.60	b.38	.98	.82	20.00

a, b, c. Characters indicating the proportions of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

ROCK AND POTASH

Furnishing Phosphoric

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.	Moisture in 100 pounds.
	SWACK'S FERTILIZER WORKS, DUBOIS, PA.		
722	†Swack's Lime, Phosphate & Potash, ...	W. H. Kaufman, R. No. 1, Harmony.	4.23
78		Sanford Runninger, Franklin, ...	
840		Union Hardware Co., Mifflinburg, ..	

†Composite sample.
*Constituent falls below guaranty.

. ERTILIZERS.

Acid and Potash.

Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Computed commercial value of 2,000 pounds at Department rating.	Selling price of 2,000 pounds at point of selection.
Available.		Insoluble.	Total.		Present as muriate.	Present as sulphate.	Total.			
Found.	Guaranteed.		Found.	Guaranteed.			Found.	Guaranteed.		
4.82	4.00	.51	5.33	4.50	.62	.....	.62	.50	.....	16.00 17.50 16.00

DISSOLVED BONE AND OTHER

Furnishing Phosphoric

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	ALLENTOWN MANUFACTURING CO., ALLENTOWN, PA.	
665	Quick Return Phosphate,	Allentown Mfg. Co., Allentown,
666	Special Complete Phosphate,	Allentown Mfg. Co., Allentown,
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK.	
111	†Ammoniated Fertilizer A.,	Milton Neimon, Dover,
73		Shultz & Bardoe, Franklin,
157		Reuben Person, Montgomery,
79	†Ammoniated Fertilizer A. A.,	T. R. Bolton, Cochranton,
12		W. F. Mundis, York, R. No. 8,
151		Reuben Person, Montgomery,
80	†Ammoniated Fertilizer A. A. A.,	T. R. Bolton, Cochranton,
35		John Greenleaf, Quarryville,
155		Reuben Person, Montgomery,
972	†Ammoniated Fertilizer A. A. A. A.,	Theodore Gerhart, Gilberts,
259		Lake Shore Fruit Co., North East,
1102	†Homestead Good Grower,	F. C. Williams, Easton,
242		Davis & Hyde, Spartansburg,
1004		F. H. Shenberger, Red Lion, R. 1,
	AMERICAN FERTILIZER CO., BALTIMORE, MD.	
33	American Ammoniated Phosphate,	A. B. Herr, Quarryville,
28	†American Fish & Bone Special,	J. M. Peifer, Quarryville,
21		H. W. Berg, East Prospect,
178		H. M. Myers, Danboro,
875	American Grain & Grass Ammoniated Phosphate.	J. H. Hartman, Hopbottom,
189	American Grain Reliable Ammoniated Formula.	S. K. Chambers & Bro., Elkview,
	ARMOUR FERTILIZER WORKS, INC., BALTIMORE, MD.	
260	†Armour's 1.50—9—0,	Vineyard Supply Co., North East,
19		H. W. Burk, East Prospect,
279		H. S. Newcomer, Mt. Joy,
38	†Armour's 2—11—0,	Brown & Shoemaker, Quarryville,
17		H. W. Burg, East Prospect,
203		W. E. Erwin, Somertou,
	ATLANTIC FERTILIZER WORKS, BALTIMORE, MD.	
366	Atlantic 2—10—0 Brand,,	James Coleman, Leraysville,
	BALTIMORE FERTILIZER CO., BALTIMORE, MD.	
841	Honest Corn Grower,	J. N. Leightner, Gettysburg,
	BAUGH & SONS CO., PHILADELPHIA, PA.	
180	†Baugh's Corn & Oats Fertilizer,	J. Watson Craft, Ambler,
50		C. W. Fritz, Quarryville,
232		W. H. Brough, Davidsville,
314	†Baugh's High Grade Ammoniated Animal Base.	W. Hass, Sec. Club, Pitman,
254		Lake Shore Fruit Co., North East,
453		H. R. Lutz, Denver,
110	†Baugh's Peninsula Grain Producer,	Milton Weimen, Dover,
51		C. W. Fritz, Quarryville,
131		Curtin Updegrave, Sacramento,
936	Baugh's Pure Dissolved Animal Bone,	Edwards Hdw. Co., Ebensburg,

†Composite sample.

ACIDULATED FERTILIZERS.

Acid and Nitrogen.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
	Available.		Insoluble.	Total.		Water soluble.	Available.	Inactive—insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.				Found.	Guaranteed.	
11.51	10.42	10.00	1.79	12.21	.....	.62	.89	b.39	1.28	1.00	23.50
4.70	9.74	5.00	2.02	11.76	10.00	1.07	1.85	b.67	2.59	2.25	27.50
8.47	10.87	10.00	1.25	12.12	11.00	.63	.74	b.14	.88	.82	20.00 26.00 18.75
7.06	10.99	10.00	1.68	12.67	11.00	1.15	1.50	a.20	1.70	1.65	25.00 23.00 22.25
6.87	10.80	10.00	1.48	12.28	11.00	1.66	2.13	a.23	2.36	2.47	28.00 25.00 22.75
5.74	10.77	10.00	1.22	11.99	11.00	2.04	2.64	a.22	*2.86	3.29	30.00 30.00
5.32	8.16	8.00	1.24	9.40	9.00	1.47	1.90	a.24	2.14	2.06	..... 24.50 22.00
8.05	12.39	10.00	1.40	13.79	11.00	.88	1.23	a.15	1.38	1.03	19.00
7.90	11.60	11.00	1.98	13.58	12.00	.90	1.43	a.20	1.62	1.65	24.00 22.00
7.67	12.33	12.00	1.02	13.35	13.00	.40	.78	a.21	.99	.82	..... 19.30
5.55	9.89	10.00	1.01	10.90	11.00	.20	.36	a.07	.43	.41	20.00
4.54	9.73	9.00	1.31	11.04	9.50	.59	.96	b.45	1.41	1.23	21.75 20.00 22.00
7.05	12.15	11.00	1.12	13.27	11.50	.54	1.09	b.59	1.63	1.65	23.00 23.00 26.00
6.00	*9.23	10.00	1.91	11.14	.....	.85	1.25	b.59	1.84	1.65	25.00
4.11	10.40	10.00	.41	10.81	11.00	.73	.83	c.25	1.08	.89	20.00
7.98	10.38	10.00	2.04	12.42	.....	.74	1.13	b.50	1.63	1.65	23.00 22.00 22.85
4.63	9.86	10.00	1.47	11.33	.....	1.95	2.70	b.56	3.26	3.30	27.00 30.00 30.00
4.37	8.81	9.00	1.80	10.61	.....	.51	.71	b.25	.96	.82	19.25 19.00 17.50
5.30	16.18	13.00	.89	17.07	.....	1.25	1.85	a.36	2.21	2.06	34.50

a, b, c. Characters indicating the proportion of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
140	†Baugh's The Old Stand By Dissolved Animal Base.	H. W. Paul Leck Kill,
54		C. W. Fritz, Quarryville,
510		H. M. Long, Oxford,
805	†Baugh's Trucker's Favorite,	Wm. P. Hay, Somerset, R. No. 4,
255		Lake Shore Fruit Co., North East,
937		J. M. Reese, Dallas,
	BOWKER FERTILIZER CO., BOSTON, MASS.	
948	†Bowker's Superphosphate with Ammonia, 4%.	Michael Haster, Nescopeck,
1275		L. F. Harris, Harrisburg,
127	†Bowker's Superphosphate with Ammonia, 1%.	Geo. Maurer, Pitman,
643		D. S. Keck, Kutztown,
619	†Bowker's Superphosphate with Ammonia, 2%.	C. H. Saunders, Sugargrove,
947		Michael Harter, Nescopeck,
	S. K. CHAMBERS & BROS., ELKVIEW, PA.	
188	Special Crop Grower,	S. K. Chambers & Bro., Elkview,
	CAMBRIA FERTILIZER CO., JOHNSTOWN, PA.	
1567	Standard Phosphate,	H. J. Eberly, Cresson,
	THOMAS FERTILIZER WORKS, CENTRAL CHEMICAL CO., HAGERSTOWN, MD.	
545	C. C. C. Acme Brand,	E. W. Kupp, Shiremanstown,
330	†C. C. C. Dissolved Bone,	Samuel Savidge, Valley View,
2 0		E. S. Thomas, Hollsopple,
544		E. W. Rupp, Shiremanstown,
803	†C. C. C. Truck Special,	S. V. Swank, Club Agt., Somerset, R. No. 2,
543		E. W. Rupp, Shiremanstown,
832		W. H. Diehl, Northumberland,
	THE CHESAPEAKE CHEMICAL CO., BALTIMORE, MD.	
1219	C. C. Co's Buyer's Favorite,	I. C. Lockwood, Hallton,
	COE MORTIMER CO., NEW YORK.	
436	†E. Frank Coe's High Grade Ammoniated Super Phosphate, 1916.	J. H. Reitz, Millway,
261		Vineyard Supply Co., North East,
939		Sherman Wardon, Dallas,
938	†E. Frank Coe's Original Ammoniated Dissolved Phosphate, 1916.	Sherman Wardon, Dallas,
1122		John W. Root, Kimberton,
1264	E. Frank Coe's Prolific Crop Producer, 1916,	C. H. Kline, Lewistown,
732	†E. Frank Coe's XXV Ammoniated Phosphate, 1916.	Geo. J. New, Blairsville,
819		Adolf Boettinger, Dauville,
	COLUMBIA GUANO CO., BALTIMORE, MD.	
797	†Columbia Deluxe Ammoniated Super Phosphate.	Schrock Bros., Friedens,
1404		I. G. Washburn, Millville,
1384	Columbia Miracle Ammoniated Super Phosphate.	M. P. Whitenight, Bloomsburg,
82	†Columbia Reflex Ammoniated Super Phosphate.	P. F. Schall, Cochranton,
360		C. H. Schmucker, Friedens,
	CONSUMER'S CHEMICAL CORPORATION, NEW YORK.	
753	†Consumer's Pure & Sure Ammoniated Bone Phosphate.	L. A. Steigerwalt, Sittelrs,
1073		W. B. Goodhart, Catawissa,
368	†Consumer's Pure & Sure Corn & Grain Bone Phosphate.	Thos. M. Allyn, Nickols, N. Y.,
1386		Zehner Bros., Bloomsburg,
754	Consumer's Pure & Sure Potato Manure without Potash.	L. A. Steigerwalt, Sittlers,
751	Consumer's Pure & Sure Potato & Vegetable without Potash.	L. A. Steigerwalt, Sittlers,

†Composite sample.

IDULATED FERTILIZERS—Continued.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
	Available.		Insoluble.	Total.		Water soluble.	Available.	Inactive—insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.				Found.	Guaranteed.	
8.73	12.23	12.00	2.29	14.52	.....	.98	1.38	b.36	1.74	1.65	20.50 23.25 24.00
7.35	10.68	10.00	1.32	12.00	.....	1.66	2.07	b.40	2.47	2.47	24.55 26.75 27.75
4.97	10.87	10.00	1.12	11.99	11.00	1.76	2.67	b.75	3.42	3.29	28.00
6.55	11.59	10.00	1.04	12.63	11.00	.61	.88	a.10	.98	.82	..... 24.00 17.51
5.68	10.56	10.00	1.46	12.02	11.00	1.23	1.59	a.17	1.76	1.65	26.50 22.65 24.00
5.88	9.59	9.00	.47	10.06	9.50	.87	1.06	b.28	1.34	1.23	23.00
1.78	11.51	7.00	1.13	12.64	9.00	.56	1.10	b.46	1.62	1.50	26.00
7.43	8.94	8.00	.28	9.22	.....	.59	.65	c.19	.84	.82	19.00
8.45	*12.46	13.00	2.12	14.58	.....	1.04	1.67	a.37	2.04	2.05	..... 26.00 27.00
6.42	10.69	10.00	.85	11.54	.....	.94	1.69	b.50	*2.19	2.50	..... 26.50 .....
5.97	10.25	10.00	1.92	12.19	11.00	.53	.78	b.35	1.13	.82	.....
6.12	11.19	10.00	1.30	12.49	11.00	1.74	2.25	a.30	2.55	2.47	26.75 21.00
6.45	11.20	10.00	1.28	12.48	11.00	1.07	1.44	a.23	1.67	1.65	....
7.17	10.85	10.00	1.66	12.24	11.00	2.01	2.66	a.42	*3.08	3.29	24.00 .....
8.96	10.59	10.00	1.21	11.80	11.00	.61	.87	a.13	1.00	.82	27.00 20.00
5.51	13.15	12.00	1.28	14.43	12.50	1.21	1.68	a.25	1.93	2.06	23.75 26.00
6.29	10.37	10.00	.83	11.20	10.50	1.28	1.58	b.22	1.80	1.65	23.60
5.23	10.90	10.00	.93	11.83	10.50	.58	.78	a.12	.90	.82	22.00 21.00
6.39	11.07	10.00	1.53	12.60	11.00	1.08	1.56	a.21	1.77	1.65	22.00 21.00
9.52	12.93	12.00	1.53	14.46	13.00	1.34	1.55	a.12	1.67	1.65	23.50 25.00
4.71	11.23	10.00	1.34	12.57	11.00	3.06	3.63	a.26	*3.89	4.12	33.00
2.89	11.16	10.00	1.36	12.52	11.00	1.98	2.86	a.43	3.29	3.29	30.00

a. b, c. Characters indicating the proportion of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
887	Consumer's Pure & Sure Corn & Vegetable without Potash.	Albert Henyou, Carbondale.
	HENRY COPE & CO., LINCOLN UNIVERSITY, PA.	
515	Ammoniated Phosphate,	L. Whitaker, Oxford,
514	Maryland Special,	L. Whitaker, Oxford,
516	Potato & Corn Phosphate,	L. Whitaker, Oxford,
	JOSIAH COPE & CO., BALTIMORE, MD.	
1370	Ammoniated Fertilizer A. A.,	Jas. Jacobs, York Springs,
	DUNGAN FERTILIZER CO., DOYLESTOWN, PA.	
215	Farmer's Favorite,	Dungan Fertilizer Co., Doylestown,
	EASTERN CHEMICAL CO., NEW YORK.	
1366	Fish Bone Mixture,	Diehl, Omwake & Diebl, Chambersburg,
	ERIE REDUCTION CO., ERIE, PA.	
253	Acidulated Fish Special,	W. D. Ripley, Wesleyville,
	FARMERS FERTILIZER SEED & HAY CO., WOMELSDORF, PA.	
34	Grass & Grain Grower,	A. B. Herr, Quarryville,
	JOSEPH R. GAWTHROP, KENNETT SQUARE, PA.	
504	Special Potato Phosphate,	Jos. R. Gawthrop, Kennett Square,
	GRIFFITH & BOYD CO., BALTIMORE, MD.	
13	†Cereal Mixture,	Geo. A. Wolf & Son, Mt. Wolf,
1148		F. S. Saddler, Point Marion,
267	Pure Dissolved Animal Bone,	W. C. Herr, Strasburg,
14	†Farmer's Bone Mixture,	Geo. A. Wolf & Son, Mt. Wolf,
160		Artley Bros., Muncy,
150	†Fish & Bone Mixture,	Weaver & Callahan, Montoursville,
72		Willis C. Herr, Strasburg,
191		S. K. Chambers & Bros., Elkview,
	S. M. HESS & BRO., PHILADELPHIA, PA.	
582	Reliable Super Phosphate,	H. M. Hostetter, Campbelltown,
486	†Standard Super Phosphate,	Thomas Slack, Wycombe,
308		N. N. Basehoar, Littletown, R. No. 2,
580		H. M. Hostetter, Campbelltown,
485	†Superior Super Phosphate,	Thomas Slack, Wycombe,
307		N. N. Basehoar, Littlestown, R. No. 2,
583		H. M. Hostetter, Campbelltown,
	HUBBARD FERTILIZER CO., BALTIMORE, MD.	
461	†Hubbard's Ammoniated Fertilizer,	W. H. Sieber, McAlisterville,
1434		James Mullen, Woodland,
98	†Hubbard's Crop Maker,	H. W. Burg, East Prospect,
357		C. H. Schmucker, Friedens,
97	†Hubbard's Excelsior Mixture,	H. W. Burg, East Prospect,
356		C. H. Schmucker, Friedens,
843	Hubbard's Oriental Guano,	J. Emery Moul, Iron Ore,
	M. P. HUBBARD & CO., BALTIMORE, MD.	
825	†Hubbard's Atlas Guano,	Jos. A. Gass, Sunbury,
1369		Alfred Harbold, Bermudian,
302	†Hubbard's Great Harvest,	M. J. Sebeffer, Hanover,
378		Billings & Keldar, New Albany,
1396	Hubbard's Slaughter House Formula,	Seymore Lockard, Millville, R. No. 2,

†Composite sample.

IDULATED FERTILIZERS—Continued.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
	Available.		Insoluble.	Total.		Water soluble.	Available.	Inactive—insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.				Found.	Guaranteed.	
9.25	10.30	10.00	1.92	12.22	11.00	1.75	2.17	b.33	2.50	2.47	24.00
10.76	10.33	10.00	1.21	11.54	.....	1.22	1.49	b.31	*1.80	2.06	23.00
8.61	*11.17	13.00	4.43	15.60	.....	1.08	1.65	a.17	*1.82	2.06	28.00
10.71	11.36	10.50	.77	12.13	.....	1.91	1.99	c.17	*2.16	2.47	26.00
7.81	11.24	10.00	1.40	12.64	11.00	1.23	1.45	a.31	1.76	1.65	22.60
9.30	10.11	8.00	2.32	12.43	9.00	.87	1.48	a.30	1.78	.82	25.00
5.33	10.58	10.00	.79	11.37	.....	.57	.86	b.28	1.14	1.25	21.50
3.36	10.32	9.00	1.03	11.35	11.00	.36	.69	b.41	1.10	1.23	21.00
6.99	4.61	.....	1.19	5.80	4.50	1.23	2.33	b1.62	3.95	4.12	27.00
7.99	7.30	5.00	1.08	8.38	6.00	.15	.53	c.62	1.15	1.00	24.00
5.00	9.18	8.00	2.28	11.46	9.00	.47	.78	a.18	.96	.85	17.00 22.00
7.81	11.78	10.00	2.04	13.82	11.00	1.34	1.83	b.44	2.27	2.00	35.00
7.88	*8.77	9.00	1.59	10.36	10.00	.77	1.12	b.53	1.65	1.65	21.00 25.00 24.00
4.47	8.41	7.00	.73	9.14	8.00	.41	.81	b.46	*1.27	1.50	24.00 21.00
5.98	10.76	10.00	.79	11.46	11.00	1.95	2.82	a.34	3.16	2.47	.....
7.66	10.96	10.00	.85	11.81	11.00	.83	1.06	a.13	1.19	.82	23.00 18.25 .....
7.70	10.62	10.00	1.03	11.65	11.00	1.15	1.53	a.18	1.71	1.65	25.50 21.25 .....
3.80	10.30	10.00	1.06	11.36	11.00	2.21	2.73	b.36	3.09	2.46	..... 25.20
9.32	11.64	10.00	1.35	12.99	11.00	.53	.71	c.36	1.07	1.02	21.00
8.08	10.68	10.00	1.34	12.02	11.00	.91	1.19	b.43	1.62	1.64	20.00 23.00
8.37	11.92	10.00	1.62	13.54	11.00	.43	.57	c.30	.87	.82	20.00
7.99	12.42	12.00	1.07	13.49	13.50	.58	.77	b.22	.99	.82	23.00 .....
8.74	10.66	10.00	.77	11.43	11.50	1.12	1.61	b.40	2.01	1.65	23.00 24.00
10.76	14.50	13.00	.45	14.95	14.50	.44	.93	a.31	*1.24	1.65	23.00

a, b, c. Characters indicating the proportion of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	INTERNATIONAL AGRICULTURAL CORPORATION, BUFFALO FERTILIZER WORKS, BUFFALO, N. Y.	
1225	Buffalo Garden Truck,	A. T. Larson, Kane,
91	†Buffalo Ideal Wheat & Corn,	H. B. Edwards & Co., Titusville,
1226		A. T. Larson, Kane, R. F. D.,
92	†Buffalo Vegetable & Potato,	H. B. Edwards Co., Titusville,
1227		A. T. Larson, Kane,
	JARECKI CHEMICAL CO., SANDUSKY, O.	
1131	Ammoniated Phosphate,	S. S. Mossholder, Rockwood,
783	†Cereals,	Chas. C. Good Co., North Girard,
1130		S. S. Mossholder, Rockwood,
	F. S. KENDERDINE & SONS, NEWTOWN, PA.	
1448	Kenderdine's Ammoniated Phosphate,	F. S. Kenderdine, Newtown,
1450	Kenderdine's B. Phosphate,	F. S. Kenderdine, Newtown,
1451	Kenderdine's 4—10—0 Phosphate,	F. S. Kenderdine, Newtown,
1449	Kenderdine's Potato Phosphate,	F. S. Kenderdine, Newtown,
	KEYSTONE BONE FERTILIZER CO., PHILADELPHIA, PA.	
1040	1916 Keystone Economy Grain Compound,	E. A. Slagle, Paxinos,
	KEYSTONE GRANGE EXCHANGE, MANSFIELD, PA.	
340	Grangers Brand,	J. A. Blough, Hollsopple, R. No. 1,
323	Grangers Choice,	Hegins Grange, Hegins, R. D.,
322	†Grangers Emergency Compound,	Hegins Grange, Hegins, R. D.,
339		J. A. Blough, Hollsopple,
	KOLLER FERTILIZER CO., SEITZLAND, PA.	
109	Koller Two and Twelve,	J. W. Sheffer, Red Lion, R. No. 2,
	LANCASTER BONE FERTILIZER CO., LANCASTER, PA.	
919		Ira Bechtel, Roaring Springs,
104	†Ammoniated Bone Manure,	Josiah Flinchbaugh, Windsor,
1047		Calvin Sower, Selinsgrove,
777	†National Crop Grower,	A. L. Veit, McKean,
920		Ira Bechtel, Roaring Springs,
551	†Seientific Organic Compound,	Harry Hoffnagle, New Oxford,
861		J. F. Schuchart, New Freedom,
	LANCASTER CHEMICAL CO., LANCASTER, PA.	
465		Christian Winey, McAlisterville,
40	†No. 10 Economist,	Brown & Shoemaker, Quarryville,
568		J. L. Royer, Myerstown,
447	†No. 5 Flag Brand,	E. B. Ruhl & Son, Manheim,
463		Christian Winey, McAlisterville,
511	No. 6 Grain Special,	H. M. Long, Oxford,
464	No. 11 Keystone Brand,	Christian Winey, McAlisterville,
565	†No. 14 Wheat & Grass,	J. L. Royer, Myerstown,
652		Wm. H. Hoffman, New Tripoli, R. No. 1,
	LISTER'S AGRICULTURAL CHEMICAL WORKS, NEWARK, N. J.	
650	Lister's Celebrated Ground Bone & Acidulated Tankage.	Geo. F. Herber, Jordan,
272	Lister's Excelsior Guano, 1916,	Eli Witmer, Lampeter,
66	†Lister's Plant Food, 1916,	Harry Mullen, Christiana,
153		David Garrett, Montgomery,
154	†Lister's Crescent Ammoniated Super Phosphate, 1916.	David Garrett, Montgomery,
292		J. C. Ernst & Co., York,

†Composite sample,

IDULATED FERTILIZERS—Continued.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
	Available.		Insoluble.	Total.		Water soluble.	Available.	Inactive—insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.				Found.	Guaranteed.	
12.15	10.68	9.00	1.34	12.02	.....	2.04	2.72	a.42	3.14	3.30	33.00
4.56	11.23	10.00	2.18	13.40	.....	.95	1.42	b.32	1.74	1.60	25.50
											26.00
9.14	11.37	10.00	2.01	13.38	.....	1.74	2.17	b.34	2.51	2.50	29.00
											30.00
8.80	10.50	10.00	.89	11.39	11.00	.32	.53	b.29	.82	.83	18.75
10.48	12.61	12.00	.95	13.56	13.00	1.16	1.62	a.10	1.77	1.65	24.50
											23.00
7.43	*9.49	10.00	1.52	*11.01	12.00	.76	.97	b.24	1.21	.80	24.00
6.57	10.94	10.00	.84	*11.78	12.00	2.18	2.53	b.26	2.79	2.47	29.00
5.29	10.11	10.00	1.42	*11.53	12.00	2.11	2.70	b.46	3.16	3.29	33.00
8.24	10.65	10.00	1.07	*11.72	12.00	.....	.....	.....	1.79	1.65	28.00
5.88	10.23	8.00	1.29	11.52	9.00	.50	.68	c.36	1.04	.82	20.00
7.00	11.59	10.00	1.25	12.84	11.00	.89	1.11	a.01	1.12	.82	19.00
8.39	12.18	11.00	1.47	13.65	12.00	.93	1.61	a.27	1.88	1.65	22.00
3.69	12.79	12.00	1.62	14.41	13.00	1.56	2.03	a.19	*2.22	2.47	25.00
											26.00
11.19	12.82	12.00	1.02	13.84	13.00	.69	1.17	b.39	1.56	1.65	21.00
4.08	9.27	9.00	.95	10.22	10.00	.48	.65	b.25	.90	.82	22.00
											.....
											.....
4.81	8.54	8.00	.38	8.92	9.00	.38	.48	c.18	.66	.41	21.00
4.67	10.50	9.00	1.72	11.22	10.00	.55	.96	b.39	1.35	1.40	20.00
											19.75
											20.00
											15.50
5.25	10.35	10.00	.84	11.19	11.00	.....	.....	.....	.....	.....	16.50
											.....
9.03	10.31	10.00	1.17	11.48	11.00	.78	1.01	a.14	1.15	1.23	21.75
											20.50
7.30	9.99	10.00	.97	10.96	11.00	.35	.....	.....	.49	.41	18.00
5.73	9.96	8.00	1.28	11.24	9.00	.61	.75	b.11	.86	.82	17.00
3.38	9.94	10.00	1.36	11.30	11.00	.68	.88	a.13	1.01	.82	.....
											20.50
11.99	8.59	.....	4.13	12.72	12.00	1.72	2.83	b.81	3.64	2.67	34.00
7.11	10.99	10.00	.73	11.72	11.00	1.71	2.61	a.29	2.90	2.47	26.50
7.75	10.51	10.00	1.14	11.65	11.00	.70	.91	a.09	1.00	.82	20.00
											21.00
7.91	10.37	10.00	1.69	12.06	11.00	1.15	1.44	a.19	1.63	1.65	22.50
											25.00

a, b, c. Characters indicating the proportion of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	LEBANON FERTILIZER WORKS, LEBANON, PA.	
676	†Levan's General Crop Grower Fertilizer,	J. H. Stover, Thompsontown,
1061		A. E. Reist, Palmyra,
	FREDERICK LUDLAM CO., BALTIMORE, MD.	
161	†Ludlam's Sickle Fertilizer No. 1, 1916,	B. L. Shipman, Muncy, R. No. 4,
537		G. R. Diffenderfer, York,
162	†Ludlam's Sickle Fertilizer No. 2, 1916,	B. L. Shipman, Muncy, R. No. 4,
295		Sechrist & Ihric, York, R. No. 2,
163	Ludlam's Sickle Fertilizer No. 3, 1916,	B. L. Shipman, Muncy, R. No. 1,
	MILLER FERTILIZER CO., BALTIMORE, MD.	
845		Nelson Merryman, Fawn Grove,
518	†Farmers Profit,	Miller T. Harkins, Hickory Hill,
1028		A. S. Welch, Mt. Union,
823		Jos. A. Goss, Sunbury,
271	†Pemlico,	Eli Witmer, Lampeter,
860		J. P. Schuchart, New Freedom,
	NASSAU FERTILIZER CO., NEW YORK.	
944	Common Sense Fertilizer, 1916,	S. D. Seward, Berwick, R. No. 2,
941	†Old Hickory, 1916,	Lewis Hnste, Dallas, R. D.,
1185		Matt Griffin, Montrose,
	G. OBER & SONS CO., BALTIMORE, MD.	
1268	Ober's Electric Compound,	W. J. Weiand, Lewistown,
985	Ober's Sun Beam Guano,	Summit Lumber Co., New Freedom,
	PATAPSCO GUANO CO., BALTIMORE, MD.	
397	†Patapsco Ammoniated Compound,	E. C. Thomas, Gettysbugr,
677		J. S. Harley, Thompsontown,
1176	Patapsco Prize Crop Compound,	Wm. Russell, Carlondale,
	PIEDMONT MT. AIRY GUANO CO., BALTIMORE, MD.	
932		A. F. Stutzman & Son, Johnstown,
391	†Piedmont Special Crop Grower,	G. R. Thompson, Gettysburg, R. No. 8,
1077		Long & Miller, Liverpool,
64		Harry Mullen, Christiana,
43	†Piedmont Utility Fertilizer,	Brown & Shoemaker, Quarryville,
401		H. D. & J. F. Bream, Gettysburg,
	PITTSBURGH PROVISION & PACKING CO., PITTSBURGH, PA.	
349		J. Z. Rhoads, Stoyestown, R. No. 1,
90	†Guano Fertilizer,	W. J. Gibson, Titusville,
737		Geo. Reuton & Co., Castle Shannon,
740	Lawn Fertilizer,	Geo. Reuton & Co., Castle Shaunon,
	POLLOCK FERTILIZER CO., BALTIMORE, MD.	
414		Francis Baker, Everett,
311	†The Pollock Fertilizer Co. Ammoniated	J. N. Duthres, New Oxford,
801	Fertilizer A.	W. H. Shaffer, Somerset, R. No. 2,
550	†The Pollock Fertilizer Co. Ammoniated	Wm. Mumma, Mechanicsburg,
1330	Fertilizer A. A.	J. H. Scott, Petersburg,
802	The Pollock Fertilizer Co. Ammoniated Fertilizer A. A. A.	W. H. Shaffer, Somerset, R. No. 2,
	PUGH & LYONS, OXFORD, PA.	
1462	B. R. P. Phosphate,	C. R. Kirk & Co., Oxford,
	THE RAMSBURG FERTILIZER CO., FREDERICK, MD.	
1367	Ammoniated Phosphate,	Frank Miller & Son, Greencastle,
1368	Excelsior Plant Food,	Frank Miller & Son, Greencastle,

†Composite sample.

IDULATED FERTILIZERS—Continued.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
	Available.			Total.					Total.		
	Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Water soluble.	Available.	Inactive—insoluble.	Found.	Guaranteed.	
3.39	10.28	10.00	1.36	11.64	11.00	.65	.85	b.22	1.07	.82	22.00 .....
8.86	11.20	10.00	1.00	12.20	11.00	.61	.80	b.15	.95	.82	....
7.33	10.30	10.00	1.91	12.21	11.00	1.29	1.62	a.18	1.80	1.65	..... 23.00
8.89	10.73	10.00	1.50	12.23	11.00	1.86	2.37	a.31	2.68	2.47	.....
11.55	8.98	9.00	.40	9.38	9.50	1.04	1.23	b.26	1.49	1.44	21.00 26.00 20.00 29.00
3.83	8.32	8.00	.34	8.66	8.50	1.96	2.21	b.19	2.40	2.47	26.75 24.00
8.48	10.90	10.00	1.09	11.99	11.00	1.26	1.61	b.24	1.85	1.65	22.00
8.83	10.30	10.00	.85	11.15	11.00	.67	.90	a.14	1.04	.82	21.00 21.00
8.00	11.81	10.00	.80	12.61	11.00	.62	.84	b.21	1.05	.82	19.25
10.26	11.93	10.00	.87	12.85	11.00	1.08	1.41	b.27	1.68	1.65	21.00
8.66	10.72	10.00	1.00	11.72	11.00	.62	.80	b.16	.96	.82	20.00 18.50
8.93	10.39	10.00	1.66	12.05	11.00	2.41	3.07	a.38	3.45	3.29	28.00
5.16	10.53	10.00	.54	11.07	.....	.61	.85	b.33	1.18	.82	25.00 18.50 .....
6.14	10.67	10.00	.85	11.52	.....	.69	1.17	b.60	1.77	1.65	22.50 22.50 23.75
4.71	8.96	9.00	2.32	11.28	11.00	.41	1.05	b.70	1.75	1.43	21.60 24.00 22.00
4.95	11.17	4.00	4.21	15.38	16.00	.54	2.00	a.94	2.94	2.87	35.00
9.47	11.13	10.00	1.15	12.28	11.00	.61	.81	b.17	.98	.82	21.00 18.50 19.00
7.25	10.46	10.00	1.64	12.10	11.00	1.52	1.91	a.15	2.06	1.65	..... 23.50
5.62	11.25	10.00	1.55	12.80	11.00	1.75	2.21	a.29	2.50	2.47	24.00
8.33	13.70	.....	4.43	18.13	7.00	.64	1.04	a.22	1.26	.82	29.00
4.70	13.28	11.00	2.00	15.28	.....	.42	.64	b.29	.93	.82	20.00
7.82	13.31	10.00	2.16	15.47	.....	1.01	1.31	b.31	1.62	1.65	24.00

a, b, c. Characters indicating the proportion of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.

*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	RASIN MONUMENTAL CO., BALTIMORE, MD.	
807	Rasiu's Grain & Grass Ammoniated Superphosphate.	Miller & Levan, Somerset, R. No. 4,
1425	Rasin's Matchless Ammoniated Phosphate,	Chas. Yeackle, Patton,
1388	Rasin's Potato & Vegetable Ammoniated Superphosphate.	H. B. Low & Son, Orangeville,
37	†Rasin's Royal Ammoniated Superphos-	John Hayes, White Rock,
407	phate.	Aspers Milling & Produce Co., Aspers,
694	†Rasin's Special Crop Preparation,	S. C. Weber, Boalsburg,
808		Miller & Lavan, Somerset, R. No. 4,
766	†Rasin's United Grain Ammoniated Super-	A. F. Kimmell, Orwigsburg,
909	phate.	Bradford & Son, Centre Hall,
	READING BONE FERTILIZER CO., READING, PA.	
628		F. A. Shecrer, Slatington,
142	†Reading All Crop Special,	Elmer Leitzel, Leck Kill,
1107		W. W. Moses, Exton,
592	Reading Harvest Queen,	C. R. Bucker, McVeytown,
868	High Grade Truck Food,	J. W. Rider, Falls,
867	Reading Prize Winner,	J. W. Rider, Falls,
546	†Schuylkill Valley Favorite,	J. F. Ritter, Carlisle, R. No. 7,
1109		W. W. Moses, Exton,
591		C. R. Bucker, Myerstown,
129	†Reading Special Potato & Tobacco Ma-	W. H. Maurer, Sec., Hegins,
655	nure.	Fred L. Pfefly, Lynnport,
441	†Tobacco & Truck Special,	B. H. Hershey, Manheim,
593		C. R. Bucker, Myerstown,
1182	Truck, Fruit Tree, Vine, Potato, Tobacco Grower.	Geo. H. Lewis, Montrose,
	READING CHEMICAL CO., READING, PA.	
1186	Reading Big Crop Special,	Geo. Rose, Montrose,
1452	Early Truck, Tobacco & Potato,	John Kirkpatrick, Newtown,
1022		W. S. Watkins, Saltillo,
833	†Reading Grain Special,	C. L. Shipman, Hughesville,
1025		J. L. Enyeast, Shirleysburg,
32	†Farmers Meat & Potash Mixture,	A. B. Herr, Quarryville,
872		Chas. Pollman, Clark Summitt,
15		C. J. Sheffer, Manchester,
834	†Pennant Winner,	C. L. Shipman, Hughesville,
873		Chas. Pollman, Clarks Summit,
	R. A. REICHARD, ALLENTOWN, PA.	
317	†American Eagle Phosphate,	Monroe Savidge, Hegins, R. D.,
632		John Kuntzman, Hellertown,
	F. S. ROYSTER GUANO CO., BALTIMORE, MD.	
223	†Royster's Flamingo Ammoniated Super-	Weaver & Berkey, Windber,
992	phosphate.	Urias Snyder, Red Lion, R. No. 2,
172	†Royster's Curfew Ammoniated Super-	Wm. C. Ball, Media,
1057	phosphate.	S. A. Phillippy, Myerstown, R. No. 4,
84		W. C. Work & Sons, Cochranton,
47	†Royster's Royal Blue Ammoniated Super-	Merton E. Haines, Pleasaut Grove,
171	phosphate.	Wm. C. Ball, Media,
	SCHALL-SHELDON FERTILIZER CO., BUFFALO, N. Y.	
244	Ammoniated Super Phosphate, No. 1,	Brooklyn Milling Co., Spartansburg,
243	Ammoniated Super Phosphate, No. 2,	Brooklyn Milling Co., Spartausburg,

†Composite sample.

IDULATED FERTILIZERS—Continued.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
	Available.			Total.					Total.		
	Found.	Guaranteed.	Insoluble.	Found.	Guaranteed.	Water soluble.	Available.	Inactive—insoluble.	Found.	Guaranteed.	
5.66	14.06	12.00	1.2[illegible]	15.31	13.00	1.02	1.46	a.19	1.65	.82	18.50
8.84	13.21	12.00	1.4[illegible]	14.61	13.00	.94	1.31	a.15	1.46	1.65	23.50
5.24	8.83	8.00	.9[illegible]	9.80	9.00	2.39	3.07	a.23	3.30	3.29	27.00
6.93	12.28	10.00	1.34	13.62	11.00	.58	.81	a.06	.87	.41	17.50
											18.00
3.68	10.74	10.00	1.09	11.83	11.00	1.08	1.47	a.20	1.67	1.65	23.25
											21.35
4.49	10.65	10.00	1.25	11.90	11.00	.79	1.17	a.10	1.27	1.0[illegible]	20.00
											24.00
											23.00
3.79	*9.73	10.00	2.27	12.00	11.00	1.17	1.46	.07	1.53	1.64	22.00
											26.00
											.....
4.62	10.14	10.00	2.46	12.60	11.00	.76	.98	a.09	1.07	1.03	30.00
5.47	13.51	12.00	1.94	14.45	13.00	2.16	2.60	a.13	*2.73	3.29	26.00
4.00	10.68	9.00	1.75	12.43	10.00	1.84	2.27	a.13	2.40	2.46	16.50
2.87	7.98	7.00	1.30	9.28	8.00	.46	.70	a.10	.89	.41	18.00
											.....
											19.75
3.80	12.07	12.00	2.03	14.10	13.00	.65	.86	a.05	.91	.82	22.00
											26.00
3.24	6.68	6.00	2.17	8.85	7.00	1.88	2.32	a.04	2.36	2.46	.....
4.82	8.24	8.00	1.68	9.92	9.00	2.10	2.63	a.09	*2.72	3.29	23.79
											20.00
5.71	8.43	8.00	1.12	9.55	9.00	.87	1.14	b.38	1.52	1.64	28.00
4.13	10.57	10.00	.55	11.12	11.00	2.86	3.15	a.11	3.26	3.28	19.50
											18.00
3.30	7.62	7.00	.33	7.95	8.00	.43	.54	b.12	.66	.41	18.50
											17.25
6.01	18.53	8.00	.64	19.17	9.00	.55	.66	c.17	.82	.82	19.00
											.....
											38.00
5.60	10.57	10.00	.74	11.31	11.00	1.21	1.82	b.66	2.48	2.46	29.00
5.73	10.58	9.00	1.28	11.86	10.00	.42	1.08	b.54	1.62	1.64	23.50
											.....
7.30	13.19	12.00	.88	14.07	12.50	1.46	1.93	b.31	2.24	2.06	26.00
											.....
2.76	9.24	8.00	1.15	10.39	8.50	1.58	2.57	a.36	*2.93	3.29	30.00
											27.25
											21.50
5.40	10.01	10.00	.9[illegible]	10.94	10.50	.52	.71	a.12	.83	.82	18.25
											23.00
6.74	9.82	10.00	1.24	11.06	11.00	.36	.63	a.17	.80	.82	.....
5.62	*9.72	10.00	1.81	11.53	11.00	1.07	1.55	a.20	1.75	1.65	.....

a, b, c. Characters indicating the proportion of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	M. L. SHOEMAKER & CO., PHILADELPHIA, PA.	
749	Echo Phosphate,	L. A. Steigerwalt, Sittlers,
750	†Swift Sure Guano for Tomatoes, Truck and Corn.	L. A. Steigerwalt, Sittlers,
183		W. E. Erwin, Somerton,
963		Richard Fogle, Hecktown,
182	†Swift Sure Super Phosphate for Tobacco & General Use.	W. E. Irwin, Somerton,
434		Frank Burkholder, Lititz,
	SCOTT FERTILIZER CO., ELKTON, MD.	
1126	Scott's Ammoniated Base,	J. W. Brunner, Belfry,
61	†Scott's Special Grain Grower,	W. G. Mellinger & Bros., West Willow,
747		Nathan Bollinger, Palmerton, R. D., R. No. 1.
	SWACK'S FERTILIZER WORKS, INC., DUBOIS, PA.	
601	†Swack's General Crop Grower,	R. H. Holmes, Mt. Jewett,
76		Sanford Runninger, Franklin,
704		C. F. Wills & Co., Parnassus,
603	†Swack's Grain & Corn,	R. H. Holmes, Mt. Jewett,
77		Sanford Runninger, Franklin,
703	†Swack's Potato & Truck,	C. F. Wills & Co., Parnassus,
839		Union Hdwre. Co., Mifflinburg,
1441	Swack's Wheat,	Hilner Hoover Hdwre. Co., DuBois,
1039		Union Hdwre. Co., Mifflinburg,
	SWIFT & CO., BALTIMORE & CLEVELAND,	
249	Swift's Pure Ammoniated Bone Phosphate,	E. L. Smith & Co., Union City,
1377	Swift's Pure Diamond "C" Grain Fertilizer.	S. F. Rarig, Catawissa,
1455	Swift's Pure Long Measure Braud,	L. W. Danehower, Southampton,
195	Swift's Pure Red Steer,	Thos. Haines & Co., Malvern,
197	†Swift's Pure Special Corn Grower,	Thos. Haines & Co., Malvern,
1163		M. C. Stewart, Indiana,
1007	†Swift's Pure Special Formula "A,"	H. W. Rehmeyer, Turn Pike,
1174		M. C. Stewart, Indiana,
1175	Swift's Pure Special Formula "B,"	M. C. Stewart, Indiana, R. No. 4,
342	†Swift's Pure Special Formula "C,"	J. A. Blough, Hollsopple, R. No. 1,
851		A. M. Grove & Co., Medley Creek Forks,
	I. P. THOMAS & SONS CO., PHILADELPHIA, PA.	
1492	Thomas' 4% Organic Fertilizer,	T. O. Bachman, Hellertown,
527	†Thomas' 1% Organic Fertilizer,	T. M. Griffith & Co., Downingtown,
119		M. F. Waser, York, R. No. 7,
772	†Thomas' Wheat & Corn Fertilizer,	H. S. Amazon, Edinboro,
120		M. F. Waser, York, R. No. 7,
774		H. S. Amazon, Ediuboro,
	F. W. TUNNELL & CO., INC., PHILADELPHIA, PA.	
489	1916 Excelsior Phosphate,	H. W. Van Artsdalen, Titusville,
484	1916 Fish Manure,	H. W. Van Artsdalen, Titusville,
491	1916 10% Guano,	H. W. Van Artsdalen, Titusville,
492	1916 No. 1 Potato & Truck Manure,	H. W. Van Artsdalen, Titusville,
959	1916 No. 2 Potato & Truck Manure,	J. A. Yost, Ringtown,
1468	1916 Potato & Vegetable Manure,	R. C. Fairlamb & Son, Brandywine Summit,
490	1916 Raw & Acidulated Animal Compound,	H. W. Van Artsdalen, Titusville,
	J. E. TYGERT CO., BY THE AM. AG. CHEM. CO., NEW YORK.	
174	†Ammoniated Fertilizer "A,"	Harry McNair, Mechanicsville,
128		Chas. Maurer, Hepler,
382		C. B. Tyler, Messhoppen,
177	†Ammoniated Fertilizer "A. A.,"	Harry McNair, Mechanicsville,
139		Chas. Maurer, Hepler,
384		C. B. Tyler, Messhoppen,
173	Ammoniated Fertilizer "A. A. A.,"	Harry McNair, Mechanicsville,

†Composite sample.

IDULATED FERTILIZERS—Continued.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
	Available.		Insoluble.	Total.		Water soluble.	Available.	Inactive—insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.				Found.	Guaranteed.	
4.73	10.83	7.00	2.73	13.56	10.00	.59	1.24	b.49	1.73	1.23	21.00
6.16	11.79	8.00	2.36	14.15	10.00	1.25	1.66	a.21	1.87	1.65	22.00 24.00
6.38	11.68	9.00	1.28	12.96	12.00	1.80	2.99	a.28	3.27	3.29	22.00 31.00 32.00
8.09	12.09	12.00	2.73	14.82	.....	1.04	1.45	a.27	1.72	1.65	25.00
7.26	11.72	10.00	2.13	13.85	.....	.76	1.06	b.33	1.39	.82	19.50 .....
3.12	10.32	10.00	1.91	12.23	11.00	.78	1.22	b.34	1.56	1.65	25.00 22.50 26.00
5.22	10.92	10.00	.48	11.40	11.00	.39	.63	a.15	.78	.85	21.75 19.50 22.00
5.43	12.75	10.00	2.60	15.35	11.00	1.43	2.52	a.72	3.24	3.39	28.00 35.00
4.64	11.05	10.00	2.78	13.83	11.00	.79	1.67	a.56	*2.23	2.47	27.50
7.02	12.08	10.00	.47	12.55	.....	.57	.79	b.24	1.03	.82	22.00
4.32	8.01	8.00	.87	8.88	.....	.23	.39	c.29	*.68	.82	18.50
4.90	9.41	9.00	1.15	10.56	.....	.38	1.09	b.55	1.64	1.65	26.00
3.95	8.76	8.00	1.72	10.48	.....	.59	.80	b.30	*1.10	1.65	22.00
5.35	10.81	10.00	1.75	12.56	.....	.69	1.23	b.71	1.94	1.65	23.00 24.50
5.25	8.97	8.00	.80	9.77	.....	1.17	2.31	b1.01	3.32	3.29	27.00 .....
7.57	*12.61	14.00	1.75	14.36	.....	.57	1.15	b.44	1.59	1.65	26.50
7.36	12.26	12.00	1.26	13.52	.....	.87	1.36	b.53	1.89	1.65	23.00 23.25
4.88	11.57	10.00	1.37	12.94	10.50	2.75	3.47	a.20	3.67	3.25	30.00
6.86	10.11	10.00	.77	10.88	10.50	.67	.91	b.21	1.12	.82	19.00 19.00
7.44	10.11	10.00	1.38	11.49	10.50	1.11	1.61	a.27	1.88	1.65	22.00 22.00 26.00
7.01	7.54	6.00	1.30	8.84	7.00	.49	.73	c.38	1.11	.82	18.90
10.63	10.64	10.00	2.17	12.81	11.00	.55	.93	b.50	*1.43	1.64	26.10
9.21	5.50	4.00	.10	5.60	5.00	5.84	6.86	a.37	*7.23	8.23	49.50
6.59	11.39	10.00	1.35	12.74	11.00	1.67	2.26	b.57	*2.83	3.30	33.60
9.42	11.22	10.00	1.34	12.56	11.00	1.32	1.83	b.46	*2.29	2.46	26.00
10.44	11.02	10.00	1.29	12.31	11.00	.59	1.06	b.54	1.60	1.64	28.00
6.30	12.99	10.00	7.36	20.35	15.00	1.18	1.55	a.19	1.74	1.64	27.90
7.68	10.97	10.00	1.12	12.09	11.00	.93	1.23	a.17	1.40	.82	19.00 19.00 21.00
8.45	10.60	10.00	.99	11.59	11.00	.98	1.43	a.21	1.64	1.65	22.00 22.00 24.00
9.51	11.17	10.00	1.34	12.51	11.00	1.55	2.16	b.48	2.64	2.47	26.00

a, b, c. Characters indicating the proportions of insoluble nitrogen that is inactive. a=2-5 or more; b=2/5 to 3/5; c=3/5 or less.

*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	THE WOOLDRIDGE FERTILIZER CO., BALTIMORE, MD.	
1395	Wooldridge's Speeial No. 2,	Grant Johnson, Millville,
351	Virginia Belle,	Jonathan Lambert, Stoyestown, R. No. 3,
	ROBERT A. WOOLDRIDGE CO., BALTIMORE, MD.	
145	†Wooldridge's Old Fidelity Phosphate,	James M. Scott, Montoursville, R. No. 3,
995		Geo. Austin, Stewartstown,
	YORK CHEMICAL WORKS, YORK, PA.	
113	†Dempwolf's Black Cross,	Geo. W. Lingston, Hellam,
44		H. Rea, Peachbottom,
458		Mauriee Leonard, McAlisterville,
1360	Dempwolf's Codorus Brand,	Enos H. Horst, Chambersburg,
1137	†Dempwolf's Corn & Oats,	Thos. Haines, Malvern,
45		H. Rea, Peachbottom,
1110		C. A. Will, Rockwood, R. No. 2,
659	†Dempwolf's Potato & Truek,	W. F. Gnagey, Berlin, R. No. 2,
812		Nathan Bitner, Germansville, R. No. 1,
1092		Edw. F. Braeken, Paoli,
331	†Dempwolf's Prosperity,	F. S. Balliet, Lehighton, R. D.,
39		Brown & Shoemaker, Quarryville,
664		Nathan Bittner, Germansville,
661	†Dempwolf's R. B. Speeial,	Nathan Bittner, Germansville,
669		Langford Bros., Compass,
1112		Thos. Haines Co., Malvern,
1005	†Dempwolf's Red Cross,	F. H. Shenberger, Red Lion, R. No. 1,
663		Nathan Bittner, Germansville,
1136		C. A. Will, Rockwood, R. No. 2,
389	†Dempwolf's Royal Mixture,	Geo. H. Duttera, Duttera,
42		Brown & Shoemaker, Quarryville,
662		Nathan Bittner, Germansville, R. No. 1,
55	Dempwolf's Top Dresser,	Chas. Witmer, Quarryville,

†Complete sample.

IDULATED FERTILIZERS—Continued.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Nitrogen in 100 Pounds.					Selling price of 2,000 pounds at point of selection.
	Available.		Insoluble.	Total.		Water soluble.	Available.	Inactive—insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.				Found.	Guaranteed.	
3.90	8.47	8.00	.61	9.08	8.50	.86	1.05	a.09	1.15	1.03	20.50
6.15	8.24	7.00	.47	8.71	7.50	.40	.54	b.20	.74	.62	18.00
8.74	10.26	10.00	1.90	12.16	11.00	1.22	1.56	a.15	1.71	1.65	22.50 .....
4.12	8.71	8.00	.55	9.26	8.50	.32	.47	c.33	.80	.82	18.00 18.00 .....
5.34	*8.67	10.00	.31	*8.98	10.50	.19	.30	c.28	.58	.41	17.00
5.25	10.68	10.00	1.71	12.39	10.50	1.60	2.07	b.39	2.46	2.47	26.00 ..... 24.50
2.72	9.05	8.00	.10	9.15	8.50	2.66	3.16	b.67	*3.82	4.10	30.55 ..... 30.00
5.43	12.61	12.00	1.16	13.77	12.50	1.26	1.50	b.26	1.76	1.65	24.00 23.00 ....
6.30	12.66	10.00	.64	13.30	10.50	.83	1.37	b.59	1.96	2.06	31.00 28.00
5.42	10.61	10.00	.51	11.12	10.50	.75	.89	c.32	1.22	1.23	20.00 ..... 20.00
.....	10.04	10.00	.89	10.93	10.50	1.10	1.33	b.25	1.58	1.65	20.90 22.50 .....
6.18	7.63	7.00	.15	7.78	7.50	3.27	4.13	b1.35	*5.48	5.74	.....

a, b, c. Characters indicating the proportion of insoluble nitrogen that is inactive: a=2/5 or more; b=2/5 to 3/5; c=3/5 or less.
*Constituent falls below guaranty.

ACIDULATED

Furnishing

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK.	
421	†Apex Acid Phosphate,	H. F. Gump & Son, Everett,
824		Jos. A. Gass, Sunbury,
152	†16% Acid Phosphate,	Reuben Person, Montgomery,
81		T. R. Bolton, Cochrantou,
346		Newton Gouder, Boswell, R. No. 1,
1371	Susquehanna Dissolved S. C. Rock,	James Jacobs, York Springs,
579	Susquehanna High Grade Super Phosphate,	H. F. Moyer, Campbelltown,
1024	†Wheeler's High Grade Acid Phosphate,	Tuckey & Co., Rock Hill Furnace,
790		B. W. Russell, Enon Valley,
1032		Wm. I. Brown, Mill Creek, R. D.,
791	Wheeler's Peerless Acid Phosphate,	B. W. Russell, Enon Valley,
	AMERICAN FERTILIZER CO., BALTIMORE, MD.	
693	†10% Acid Phosphate,	J. H. Neidigh, State College,
856		Burt Hoff, Spring Grove,
570	†American High Grade Acid Phosphate,	N. R. Yost, Myerstown,
63		Jones Eavenson, Christiana,
692		J. H. Neidigh, State College,
	ARMOUR FERTILIZER WORKS, BALTIMORE, MD.	
519	†Acid Phosphate, 16%,	Passmore & Co., Nottingham,
376		Orwell Grange, Orwell,
700		A. M. Ashe, Kittanning, R. No. 2,
353	†Star Phosphate, 14%,	D. G. Stufft, Stoyestown,
18		H. W. Burg, East Prospect,
701		A. M. Ashe, Kittanning,
	BALTIMORE FERTILIZER CO., BALTIMORE, MD.	
842	Honest Acid Phosphate,	J. N. Lightner, Gettysburg,
	BAUGH & SONS CO., PHILADELPHIA, PA	
52	†Baugh's 16% Acid Phosphate,	C. N. Fritz, Quarryville,
3		Brillinger & Swartz, Emigsville,
141		H. W. Paul, Leck Kill,
	BOWKER FERTILIZER CO., BOSTON, MASS.	
789	†Bowker's 16% Acid Phosphate,	G. L. Rommel, Enon Valley,
911		Robt. Smith, Centre Hall,
	CENTRAL CHEMICAL CO., THOMAS FERTILIZER WORKS, HAGERSTOWN, MD.	
542	†C. C. C. Dissolved Phosphate,	E. W. Rupp, Shiremanstown,
810		H. E. Barclay, Somerset, R. No. 4,
	COE MORTIMER CO., NEW YORK.	
166	†E. Frank Coe's High Grade Soluble Phosphate.	Adolf Boettinger, Danville,
124		Chas. Schoffstall, Valley View,
374		C. B. Estabrook, Rummerfield,
818	†E. Frank Coe's 16% Super Phosphate,	Adolf Boettinger, Danville,
375		C. B. Estabrook, Rummerfield,
1151		P. G. Conn, Point Marion,
	COLUMBIA GUANO CO., BALTIMORE, MD.	
1385	Columbia 14% Acid Phosphate,	M. P. Whitenight, Bloomsburg,

†Composite sample.

ROCK PHOSPHATE.

Phosphoric Acid.

Moisture in 100 lbs.	Phosphoric Acid in 100 lbs.					Selling price of 2,000 pounds at point of solution.
	Available.		Insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.	
4.18	11.13	10.00	.65	11.78	11.00	17.25
						16.00
						18.50
8.40	16.83	16.00	.87	17.70	17.00	20.00
						19.00
4.89	15.77	14.00	.65	16.42	15.00	18.25
10.67	16.28	16.00	.75	17.03	17.00	16.00
						20.00
9.34	17.22	16.00	.61	17.83	17.00	19.50
						17.60
6.87	14.08	14.00	1.06	15.14	15.00	18.50
3.22	11.37	10.00	1.15	12.52	11.00	17.00
						14.75
						20.00
6.08	16.01	16.00	1.20	17.21	17.00	17.00
						19.00
						19.00
8.02	17.19	16.00	.38	17.57	16.50	17.70
						22.00
						20.00
8.03	14.48	11.00	.56	15.04	14.50	18.00
						21.00
9.57	15.06	14.00	.13	15.19	15.00	17.50
						18.00
11.11	16.96	16.00	.51	17.47	.....	18.00
						18.00
8.99	16.11	16.00	.70	16.81	17.00	20.00
						18.50
8.96	16.12	16.00	.55	16.67	.....	19.00
						18.00
7.18	14.52	14.00	.98	15.50	15.00	16.50
						17.60
						16.70
9.88	15.85	16.00	1.36	17.21	17.00	17.50
						19.00
						20.00
6.54	14.32	14.00	1.07	15.39	14.50	19.10

*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	CONSUMERS CHEMICAL CORPORATION, NEW YORK.	
894	†Consumer's Pure Sure Acid Phosphate,	E. H. Hayes, Clintondale,
67		Allan Walton, Christiana,
1054		W. B. Goodhart, Catawissa,
451	†Consumer's High Grade Acid Phosphate,	Eli Martin, New Holland,
367		T. M. Allyn, Nickols, N. Y.,
895		E. H. Hayes, Clintondale,
	HENRY COPE & CO., LINCOLN UNIVERSITY, PA.	
517	Acid Phosphate,	L. Whitaker, Oxford,
	JOSIAH COPE & CO., BALTIMORE, MD.	
804	High Grade Super Phosphate,	Ed. H. Miller, Somerset, R. No. 4,
	W. S. FARMER & CO., NEW YORK.	
310	W. S. Farmer & Co.'s High Grade Super Phosphate.	J. N. Duthree, New Oxford,
	FARMERS FERTILIZER & FEED CO., WESTMINSTER, MD.	
385	Acid Phosphate,	C. C. Brown, East Berlin,
	FARMERS FERTILIZER WORKS, ELIZABETHTOWN, PA.	
1270	†Acid Phosphate,	J. D. Greyhill & Son, Belleville,
1296		B. F. Horting, Newport,
	GRIFFITH & BOYD CO., BALTIMORE, MD.	
522	†High Grade Acid Phosphate,	R. L. Myers, Dickinson,
201		S. K. Chambers & Bro., West Grove,
854		Anderson Bro., New Park,
	S. M. HESS & BRO., PHILADELPHIA, PA.	
429	†High Grade Acid Phosphate,	Frank Reighard, Bedford, R. No. 1,
227		Moses Weaver, Johnstown, R. No. 4,
457	Special High Grade Acid Phosphate,	Wm. Peffenberger, Mifflintown,
584		H. M. Hostetter, Campbelltown,
1018		Ira Price, Everett, R. D.,
	THE HUBBARD FERTILIZER CO., BALTIMORE, MD.	
405	†Huhhard's 16% Phosphate,	Biglerville Warehouse Co., Biglerville,
1012		E. H. Hartle, Osterhurg,
404	†Hubbard's 12% Phosphate,	Biglerville Warehouse Co., Biglerville,
359		C. H. Schmucker, Friedens,
462		W. H. Sieber, McAlisterville,
	M. P. HUBBARD & CO., INC., BALTIMORE, MD.	
826	†Huhhard's Dissolved Phosphate,	Jos. A Gass, Sunhury,
379		Biglerville & Keldar, New Albany,
862		J. P. Schuchart, New Freedom,
369	Huhhard's Soluhle Phosphate,	M. J. Sheffer, Hanover,
	INTERNATIONAL AGRICULTURAL CORPORATION, BUFFALO FERTILIZER WORKS, BUFFALO, N. Y.	
1231	Buffalo Dissolved Phosphate,	O. Wellett & Ferwelliger, Galeton,
	JARECKI CHEMICAL CO., SANDUSKY, O.	
782	C. O. D. Phosphate,	Chas. C. Good Co., North Girard,
	KEYSTONE GRANGE EXCHANGE, MANSFIELD, PA.	
324	†16% Acid Phosphate,	I. E. Artz, Sec., Hegins Grange, Hegins,
338		J. A. Blough, Hollsopple, R. No. 1,

†Composite sample.

PHOSPHATE—Continued.

Moisture in 100 lbs.	Phosphoric Acid in 100 lbs.					Selling price of 2,000 pounds at point of solution.
	Available.		Insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.	
7.93	15.45	14.00	1.06	16.51	15.00	18.00 23.00 17.00
8.80	17.02	16.00	.83	17.85	17.00	19.00 19.00 19.00
10.65	15.20	14.00	.97	16.17	.....	16.00
11.16	16.44	16.00	.41	16.85	17.00	18.50
11.68	16.10	16.00	1.02	17.12	17.00	18.00
10.84	14.49	14.00	.89	*15.38	16.00	.....
4.16	14.98	14.00	.55	15.53	.....	18.50 16.00
10.00	15.80	14.00	.68	16.48	15.00	..... 18.00 17.50
8.62	14.49	14.00	1.16	15.65	15.00	..... 19.00
10.35	16.33	16.00	.79	17.12	17.00	..... 19.50
12.50	17.02	16.00	.18	17.20	17.00	19.00 20.50
6.50	14.87	*12.00	1.44	16.31	13.00	17.00 18.00 .....
10.01	16.57	16.00	.45	*17.02	17.50	19.00 19.00 17.50
7.61	14.16	14.00	1.41	15.57	15.50	19.00
9.07	*11.11	14.00	.83	*11.94	.....	19.00
12.30	14.61	14.00	.60	15.21	15.00	19.00
9.47	16.45	16.00	1.21	17.66	17.00	17.50 17.00

*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	FREDERICK LUDLAM CO., BALTIMORE, MD.	
164	Ludlam's Cecrops Fertilizers Dissolved Phosphate.	B. L. Slupman, Muncy, R. No. 4,
165	Ludlam's Cecrops Fertilizers H. G. Dissolved Phosphate.	B. L. Slupman, Muncy, R. No. 4,
	LANCASTER BONE FERTILIZER CO.	
388	Grange Special,	Harry Hoffnagle, New Oxford,
	LANCASTER CHEMICAL CO., LANCASTER, PA.	
512	†No. 8 Acid Phosphate,	H. M. Long, Oxford,
29		Amos Gilbert, Quarryville,
540		J. D. Buckhart, Newville,
	NASSAU FERTILIZER CO., NEW YORK.	
430	†High Grade Super Phosphate,	J. H. Brown, Loysburg,
549		Wm. Mumma, Mechanicsburg,
	NITRATE AGENCIES CO., NEW YORK.	
943	†High Grade Acid Phosphate, 16%,	C. E. Bronson Loyalville,
968		Harry Lear, Pocono Grange, Tannersville,
	G. OBER & SONS CO., BALTIMORE, MD.	
394	Disolved Phosphate, 14%,	D. Blocker & Co., Gettysville,
	PATAPSCO GUANO CO., BALTIMORE, MD.	
387	†Battle Ax Phosphate,	J. N. Hersh, New Oxford,
473		J. S. Horley, Thompsontown, ..
479	Patapsco Dissolved Phosphate,	J. S. Horley, Thompsontown,
361	Patapsco Pure Dissolved S. C. Phosphate,	D. Ringrose, Cadis,
	PIEDMONT MT. AIRY GUANO CO., BALTIMORE, MD.	
1075	†Piedmont 14% Acid Phosphate,	Long & Miller, Liverpool,
390		G. R. Thompson, Gettysburg,
1135		P. A. Brugh, Rockwood,
65	†Piedmont 12% Acid Phosphate,	Harry Mullen, Christiana,
1076		Long & Miller, Liverpool,
	PITTSBURGH PROVISION & PACKING CO., PITTSBURGH, PA.	
350	Acid Phosphate,	J. Z. Rhoads, Club Agt., Stoyestown, R. 1,
	POLLOCK FERTILIZER WORKS, BALTIMORE, MD.	
345	†The Pollock Fertilizer Co. High Grade Super Phosphate.	W. F. Shaulis, Hollsopple, R. No. 4,
306		J. N. Keltz, Littlestown,
424		Jno. L. Bortz, Bedford,
	RASIN MONUMENTAL CO., BALTIMORE, MD.	
1258	Rasin's Sea Wall Special,	S. C. Weber, Boalsburg,
	READING BONE FERTILIZER CO., READING, PA.	
1338	16% Acid Phosphate,	Geo. Richards, Mariondale,
	ROBERT A. REICHARD, ALLENTOWN, PA.	
635	Acid Phosphate,	Jno. Kuntzman, Hellertown,
	F. S. ROYSTER GUANO CO., BALTIMORE, MD.	
85	†Royster's H. G. 16% Acid Phosphate,	W. C. Work & Son, Cochranton,
46		Merton S. Haines, Pleasant Grove,
159		Myers & Slonaker, Hughesville,
86	†Royster's 14% Acid Phosphate,	W. C. Work & Son, Cochranton,
49		Merton E. Haines, Pleasant Grove,
158		Myers & Slonaker, Hughesville,

†Composite sample.

PHOSPHATE—Continued.

Moisture in 100 lbs.	Phosphoric Acid in 100 lbs.					Selling price of 2,000 pounds at point of solution.
	Available.		Insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.	
9.05	14.23	14.00	1.02	15.25	15.00	.....
11.37	16.33	16.00	.77	17.10	17.00	.....
9.52	17.10	16.00	.42	17.52	.....	.....
9.76	14.01	14.00	.41	*14.42	15.00	18.00 15.85 .....
8.95	16.47	16.00	.73	17.20	17.00	18.50 18.50
9.24	17.20	16.00	.19	17.39	17.00	19.00 25.00
6.94	15.63	14.00	.50	16.13	15.00	17.00
5.49	12.56	12.00	.70	13.26	13.00	18.50 16.80
8.97	*16.73	18.00	.32	*17.05	19.00	20.50
6.99	14.17	14.00	.77	14.94	15.00	14.50
8.97	15.25	14.00	.09	15.34	.....	..... 17.25 17.50
8.72	13.68	12.00	.10	13.78	.....	16.50 .....
6.45	12.50	11.00	.70	13.20	12.00	17.60
8.87	17.23	16.00	.23	17.46	17.00	18.50 18.00 19.00
4.71	10.56	10.00	.89	11.45	11.00	16.50
6.61	17.15	16.00	1.82	18.97	17.00	19.00
4.04	14.86	14.00	.33	15.19	15.00	.....
7.52	17.29	16.00	.50	17.79	16.50	21.25 17.75 21.00
4.83	14.64	14.00	.99	15.63	14.50	20.25 16.75 19.50

*Constituent falls below guaranty.

Sample number.	Manufacturer and Brand.	From Whom Sample Was Taken.
	SMITH'S AGRICULTURAL CHEMICAL CO., COLUMBUS, O.	
784	Smith's 16% Acid Phosphate.	C. R. Forbs, Albion,
	SWIFT & CO., BALTIMORE, MD.	
248	†Swift's Pure Garden City Phosphate,	E. L. Smith & Co., Union City,
196		Thos. Haines & Co., Malvern,
720		A. H. Knauff, Harmony,
1165	Swift's Pure High Grade Acid Phosphate,	M. C. Stewart, Indiana,
	SWACK'S FERTILIZER WORKS, DUBOIS, PA.	
705	Swack's Acid Phosphate, 16%,	C. T. Wills & Co., Parnassus,
	I. P. THOMAS & SONS CO., PHILADELPHIA, PA.	
773	†16% Acid Phosphate,	H. S. Amazon, Edinboro,
1023		C. E. Starr, Three Springs,
	TUSCORARA FERTILIZER CO., BALTIMORE, MD.	
1485	Acid Phosphate, 14%,	L. B. Longanecker, Greensboro,
	J. E. TYGERT CO., by AM. AG. CHEM. CO., NEW YORK.	
558	18% Acid Phosphate,	J. Brenneman, Lisburn,
383	†16% Acid Phosphate,	C. B. Tyler, Messhoppen,
559		J. Brenneman, Lisburn,
	VIRGINIA CAROLINA CHEM. CO., RICHMOND, VA.	
409	V. C. C. Co.'s 16% Acid Phosphate,	G. E. Knisley, Reynoldsville,
	WARREN FERTILIZER CO., WARREN, PA.	
1200	Warren Soluble Phosphate,	Pickett's Hardware Co., Warren,
	WASHINGTON, ALEXANDER & COOK CO., CHARLESTOWN, W. VA.	
399	W. A. & C.'s Acid Phosphate,	E. S. Kelly, Gettysburg,
	ROBT. A. WOOLDRIDGE CO., BALTIMORE, MD.	
431	†Wooldridge's Florida Acid Phosphate,	Adam Beach, New Enterprise,
146		James M. Scott, Montoursville,
474		J .M. Peterson, Honey Grove,
	YORK CHEMICAL WORKS, YORK, PA.	
107	†Dempwolf's Superphosphate,	Dover Farmers Coop. Asso., Dover,
56		Charles Witmer, Quarryville,
459		Maurice Leonard, McAlisterville,

*Constituent falls below guaranty.

PHOSPHATE—Continued.

Moisture in 100 lbs.	Phosphoric Acid in 100 lbs.					Selling price of 2,000 pounds at point of solution.
	Available.		Insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.	
5.89	16.96	16.00	.41	17.37	.....	21.00
7.70	15.11	14.00	.74	15.85	.....	20.00 18.00 21.00
8.42	16.41	16.00	.83	17.24	.....	19.50
9.25	15.90	16.00	.88	*16.78	17.00	22.00
11.13	17.09	16.00	.68	17.77	16.50	20.00 18.50
9.25	15.19	14.00	.24	15.43	14.50	21.50
9.97	18.75	18.00	.42	19.17	19.00	.....
14.57	16.21	16.00	.51	*16.72	17.00	20.00 .....
10.74	16.86	16.00	.82	17.68	17.00	19.80
10.03	16.75	16.00	.89	17.64	.....	22.00
9.75	15.21	14.00	1.26	16.47	15.00	17.00
8.63	14.57	14.00	1.06	15.63	15.00	18.00 18.00 .....
11.40	16.40	16.00	.15	16.55	16.50	17.10 ..... 18.00

†Composite sample.

GROUND BONE

Furnishing Phosphoric

Sample No.	Manufacturer and Braud.	From Whom Sample Was Taken.
	THE AHREN FERTILIZER CO., LORANE, PA.	
1353	Pure Bone Meal,	H. Ahren, Lorane,
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK.	
251	†Fine Ground Bone,	Union Coal & Supply Co., Union City,
728		Thompson & Gleun, Butler,
1082	High Grade Ground Bone,	Harvey L. Moses, Chester Spriugs,
914	Pure Raw Bone,	H. L. Stultz & Bro., Altoona,
	ARMOUR FERTILIZER WORKS, CHICAGO, ILL.	
96	Bone Meal, 3-22,	United Hardware & Supply Co., Titusville,
	ASSOCIATED CHEMICAL CO., HAGERSTOWN, MD.	
1389	Fine Grouud Bone,	John W. Kline, Catawissa, Pa.,
	BAUGH & SONS CO., PHILADELPHIA, PA.	
256		Lake Shore Fruit Co., North East,
53	†Baugh's Pure Steamed Bone,	C. W. Fritz, Quarryville,
347		J. S. Rhoads, Stoyestown, R. No. 1,
508		Harvey G. Shortlidge, Kelton,
106	†Baugh's Raw Bone Meal, Warranted Pure	Geo. W. Holtzinger, Red Lion,
687		J. G. Brubaker, Riehfield,
	BOWKER FERTILIZER CO., NEW YORK.	
1221	Bowker's Fresh Ground Boue,	J. A. Stall & Co., Kane,
	THE DUNGAN FERTILIZER CO., DOYLESTOWN, PA.	
481	Bone Flour,	Dungan Fertilizer Co., Doylestown,
	GRIFFITH & BOYD CO., BALTIMORE, MD.	
268	†Pure Fiue Ground Bone Meal,	Willis C. Herr, Strasburg,
520		Passmore & Co., Nottingham,
266	Soft Ground Bone Meal,	Willis C. Herr, Strasburg,
	HAFLEIGH & CO., PHILADELPHIA, PA.	
1467	Pure Raw Bone Meal,	S. C. Walker & Co., Chadds Ford Junction,
	INTERNATIONAL AGRICULTURAL CORPORATION, BUFFALO FERTILIZER WORKS, BUFFALO, N. Y.	
1349	Buffalo Bone Meal,	Vietor Lantz, Mt. Jewett, R. D.,
	MARTIN FERTILIZER CO., PHILADELPHIA, PA.	
1464	Martin's Pure Ground Bone,	C. R. Kirk & Co., Oxford,
	HENRY F. MICHELL CO., PHILADELPHIA, PA.	
1274	Michell's Fine Ground Bone Meal,	Mr. Quinn, Harrisburg,
	THE MILLER FERTILIZER CO., BALTIMORE, MD.	
1403	Ground Bone,	Grant Johnson, Millville,

†Composite sample.

FERTILIZERS.

Acid and Nitrogen.

Moisture in 100 pounds.	Mechanical Analysis.		Chemical Analysis.				Selling price of 2,000 pounds at point of selection.
			Phosphoric Acid.		Nitrogen.		
	Diameter less than 1-50 inch. "Fine."	Diameter greater than 1-50 inch. "Coarse."	Found.	Guaranteed.	Found.	Guaranteed.	
7.18	27	73	22.63	22.34	4.41	4.19	35.00
3.68	61	39	23.55	22.88	2.45	2.47	34.00 34.00
4.28	40	60	24.96	20.59	3.15	3.29	29.50
7.07	41	59	*21.12	21.51	3.72	3.70	50.00
5.02	60	40	*20.58	22.00	2.57	2.47	35.00
5.76	50	50	22.83	23.00	2.97	2.87	35.50
8.89	49	51	28.19	25.00	1.74	1.65	33.00 33.00 32.50
7.12	47	53	21.31	21.50	3.76	3.70	40.00 ..... 39.50
3.50	58	42	23.00	22.88	2.51	2.47	37.00
6.64	45	55	*12.44	20.00	*2.43	3.70	35.00
6.84	42	58	*19.91	22.00	3.81	3.30	40.00 40.00
3.92	59	41	14:67	11.00	2.86	2.50	38.00
8.82	50	50	*24.41	25.84	3.78	3.75	40.00
4.16	56	44	22.74	22.00	2.53	2.50	35.00
6.70	50	50	25.90	22.90	2.16	1.65	34.00
7.39	50	50	17.76	16.49	2.60	2.47	.....
4.52	58	42	23.51	13.92	2.66	2.47	37.00

*Constituent falls below guaranty.

Sample No.	Manufacturer and Brand.	From Whom Sample Was Taken.
	PITTSBURG PROVISION & PACKING CO., PITTSBURGH, PA.	
89	†Pure Raw Bone Meal,	W. J. Gibson, Titusville,
733		I. W. Scott Co., Pittsburgh,
734	No. 1 Pure Raw Bone Meal,	I. W. Scott Co., Pittsburgh,
	PUGH & LYONS, OXFORD, PA	
1463	Ground Raw Bone,	C. R. Kirk & Co., Oxford,
	READING BONE FERTILIZER CO., READING, PA.	
1108	Pure Bone Meal,	W. W. Moses, Exton,
958	Pure Raw Bone,	Sugar Loaf Grange, Conyngham,
	REICHARD HIDE AND TALLOW CO., ASHLAND, PA.	
1416	Pure Ground Bone,	Fred Craig, Catawissa,
	F. S ROYSTER GUANO CO., BALTIMORE, MD.	
169	Royster's Fine Ground Bone Meal,	Wm. C. Ball, Media,
759	Royster's Pure Raw Bone Meal,	Milton Miller, R. No. 3, Tamaqua,
	F. W. TUNNELL & CO., PHILADELPHIA, PA.	
1083	Pure Ground Bone,	W. B. Passmore, Embreeville,

†Composite sample.

PHOSPHATE—Continued.

Moisture in 100 pounds.	Mechanical Analysis.		Chemical Analysis.				Selling price of 2,000 pounds at point of selection.
	Diameter less than 1-50 inch. "Fine."	Diameter greater than 1-50 inch. "Coarse."	Phosphoric Acid.		Nitrogen.		
			Found.	Guaranteed.	Found.	Guaranteed.	
7.10	30	70	*18.59	21.00	4.39	3.70	32.00 28.00
5.52	48	52	22.06	22.00	3.56	3.70	31.00
6.55	34	66	23.82	20.00	3.51	3.30	38.00
3.07	50	50	20.25	18.00	3.91	2.46	36.00
5.73	46	54	21.92	18.00	3.30	3.29	36.00
7.86	3	97	*22.50	25.00	3.91	3.46	31.00
3.66	62	38	23.30	22.90	2.64	2.47	40.00
5.98	50	50	24.53	21.50	3.56	3.70	.....
4.56	50	50	29.12	23.00	*1.18	2.46	35.00

*Constituent falls below guaranty.

MISCELLANEOUS

Sample No.	Manufacturer and Brand.	From Whom Sample Was Taken.
	AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK.	
513	Basic Lime Phosphate,	Mackey & Yerkes, Oxford,
1298	†Ground Untreated Phosphate Rock,	B. F. Horting, Newport,
1397		A. R. Whitmoyer, Unityville,
915	†Nitrate of Soda,	H. L. Stutz & Bro., Altoona,
984		Wm. Weaver, Freemansburg,
	ARMOUR FERTILIZER WORKS, BALTIMORE, MD.	
445	Ground Tankage, 7-20,	S. H. Snavely, Manheim,
	BAUGH & SONS CO., PHILADELPHIA, PA.	
506	†High Grade Tankage,	H. S. Shortlidge, Kelton,
946		Thomas Garrison, Berwick,
	FEDERAL CHEMICAL CO., COLUMBIA, TENN.	
930		C. S. Clark, Falls,
869	†Daybrake Tennesse Brown Phosphate Rock.	J. W. Rider, Bellwood,
1062		E. Gerhart and Sons, Jonestown,
	J. L. HUNTER & SONS, PITTSTON, PA.	
942	Exeter Tankage,	C. E. Bronson, Loyalville,
	LEBANON FERTILIZER WORKS.	
1277	Levan's Animal Tankage,	W. A. Bailets, Dauphin,
	MT. PLEASANT FERT. CO., MT. PLEASANT, TENN.	
250	†Fine Ground Phosphate Rock,	E. L. Smith and Co., Union City,
1387		H. B. Low and Son, Orangeville,
	NITRATE AGENCIES CO., NEW YORK.	
502	†Nitrate of Soda,	Frank B. Carrolls, Neshaminy,
735		I. W. Scott Co., Pittsburgh,
	PITTSBURGH PROVISION & PACKING CO., PITTSBURGH, PA.	
741	Nitrate of Soda,	Beckert's Seed Store, Pittsburgh,
739	Pure Bone & Meat,	Geo. Renton & Co., Castle Shannon,
	SWACK'S FERTILIZER WORKS, DUBOIS, PA.	
602	†Swack's High Grade Tankage,	R. H. Holmes, Mt. Jewett,
1171		I. W. Gibson, Indianna,
	WITHERBEE SHERMAN & CO., PORT HENRY, N. Y.	
884	Barium Phosphate,	W. F. Bennett, Clifford,

†Composite sample.

FERTILIZERS.

Moisture in 100 pounds.	Phosphoric Acid in 100 Pounds.					Potash in 100 Pounds.				Nitrogen in 100 Pounds.					Selling price of 2,000 lbs. at point of selection.
	Available.		Insoluble.	Total.		Present as Muriate.	Present as Sulphate.	Total.		Water Soluble.	Available.	Inactive Insoluble.	Total.		
	Found.	Guaranteed.		Found.	Guaranteed.			Found.	Guaranteed.				Found.	Guaranteed.	
4.04	13.22	13.00	.....	15.03	.....	.....	.....	.....	.....	....	....	.....	.....	.....	22.00
.44	.....	.....	.....	*30.19	31.12	.....	.....	.....	.....	....	....	.....	.....	.....	{ 12.85
.89	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	15.98	15.00	{ 14.75 { 80.00 { 75.00
6.95	.....	.....	.....	9.18	9.28	.....	.....	.....	.....	1.93	3.56	b1.54	*5.10	5.76	34.84
9.69	.....	.....	.....	8.50	4.00	.....	.....	.....	.....	1.59	3.88	b1.64	*5.52	6.58	{ 36.00 { .....
.67	.....	.....	.....	*29.06	29.75	.....	.....	.....	.....	....	....	.....	.....	.....	{ ..... { 9.00 { 10.50
3.10	.....	.....	.....	17.03	13.60	.....	.....	.....	.....	1.84	3.47	b1.35	*4.82	6.60	32.00
5.67	.....	.....	.....	*6.31	9.74	.....	.....	.....	.....	1.43	2.38	b1.33	*3.71	5.78	35.00
.51	.....	.....	.....	31.40	29.75	.....	.....	.....	.....	....	....	.....	.....	.....	{ 10.00 { 10.00
....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	15.46	15.00	{ 64.00 { 80.00
.47	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	....	.....	15.77	14.80	160.00
6.96	.....	.....	.....	*6.60	8.00	.....	.....	.....	.....	.87	5.93	a2.53	8.40	4.92	26.00
7.40	.....	.....	.....	14.20	12.00	.....	.....	.....	.....	1.37	4.36	a1.04	5.40	5.00	{ 36.50 { 40.00
....	.67	.....	15.16	15.83	14.00	.....	.....	.....	.....	....	....	.....	.....	.....	17.50

a, b, c. Characters indicating the proportions of insoluble nitrogen that is inactive. a=2-5 or more; b=2-5 to 3-5; c=3-5 or less.
*Constituent falls below guaranty.